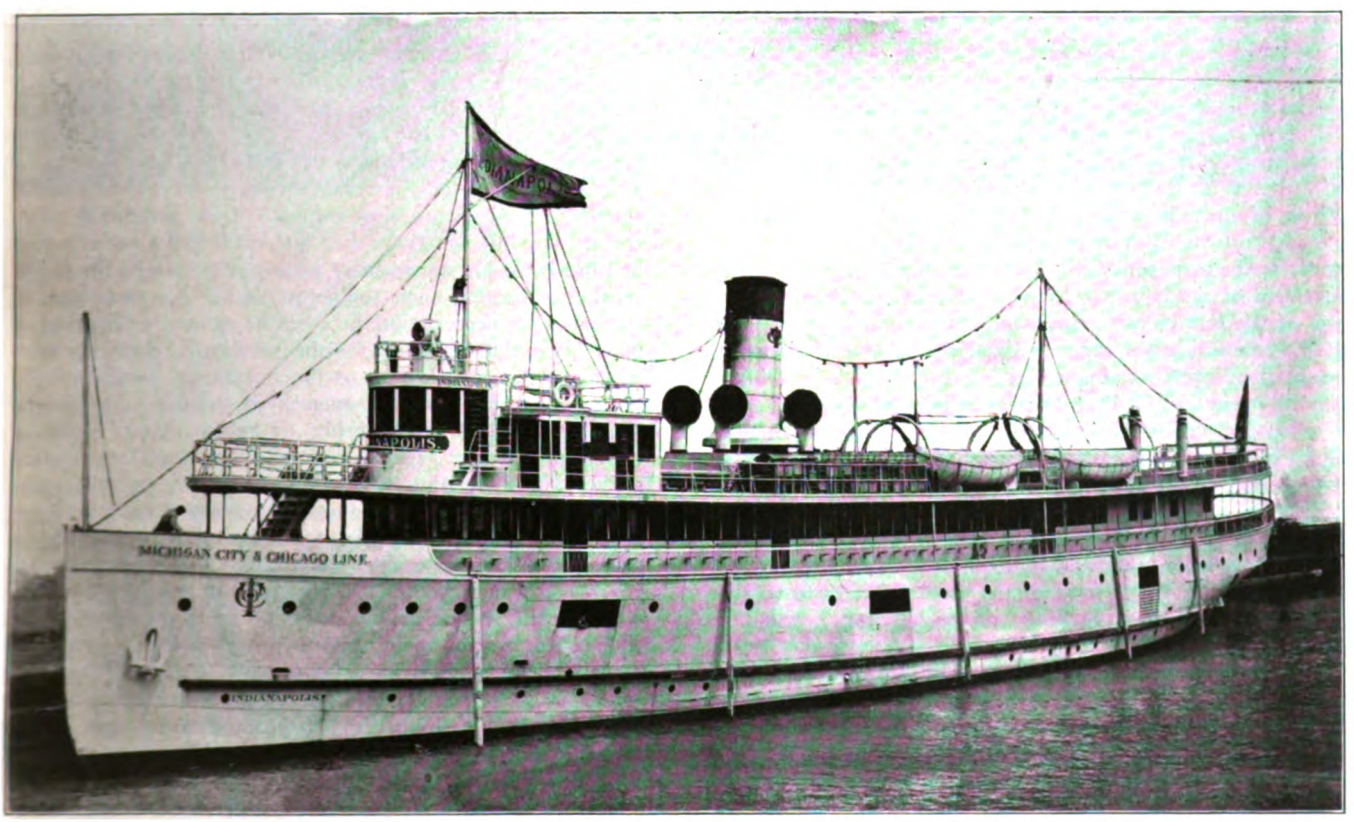
MARINE REVIEW

VOL. XXX. CLEVELAND, O., JULY 28, 1904. No. 4.

## FUTURE OF SHIP MASTERS' ASSOCIATION.

It was for some time feared that the ill-feeling engendered between the masters themselves during their recent controversy with the vessel owners would result in the disruption of the Ship Masters' association. The Ship Masters' association is a social and benevolent organization and is not to be confused with the Masters' & Pilots' association. There is no doubt whatever but that the Ship Masters' association has been a great benefit to the masters and it is regrettable that the life of this organization should have been put into any danger whatever through a controversy in which it had no part. Vessel owners are a unit in expressing the hope that the Ship Masters' association will be continued. Capt. Thomas Jones, grand treasurer, says that, while he expects there may be some withdrawals from the association, the number will be more than counterbalanced by new members admitted. Capt. F. B. Higgie of Chicago, grand secretary, has sent out a circular letter urging members to stand by the association.




STEAMER INDIANAPOLIS OF THE INDIANA TRANSPORTATION CO.'S FLEET, PLYING BETWEEN CHICAGO AND MICHIGAN CITY.

[*Built by the Craig Ship Building Co., Toledo.*

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It appears that Harris W. Baker of Detroit has been successful in locating the wreck of the steamer W. H. Stevens, which foundered in the fall of 1902 in mid-lake off Conneaut with a cargo of copper aboard. About 90 tons of the copper have been recovered.

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# Merchant Marine Commission.

Milwaukee, Wis., July 22.—The Merchant Marine Commission ended its great lakes' hearings at this port yesterday A long list of capitalists, manufacturers and transportation men told the commission that they favored government aid for the merchant marine, but they varied as to their methods. Most of them believed that direct subsidies would meet with no favor from the public. After the close of the hearing, Senator Gallinger of New Hampshire, chairman of the commission, declared that the hearings of the commission had proven that public sentiment is opposed to direct subsidy legislation.

An interesting point was brought out at the hearing by Congressman Spight of Mississippi, a member of the commission, who suggested that foreign nations which granted subsidies and subventions were violating the spirit of the reciprocity treaties they had made with the United States. From this he argued that the United States would be justified in abrogating the treaties, which are now a bar to a plan of discriminating duties.

The manufacturers heard by the commission laid particular stress on the fact that under present conditions American exporters are seriously hampered by the lack of shipping facilities, that the repeated transshipment which is now necessary to bring goods to their destination cause loss, and that foreign lines refuse redress for breakage. This, coupled with long delays in finding vessels to various ports, they declared, prevents a proper growth of export trade, and might be obviated by American lines and American methods.

The men who testified before the commission were: Frank G. Bigelow, president of the American Bankers' association; David C. Harlowe, traffic manager of the Allis-Chalmers Co.; Walter Read, president of the Filer-Stowell Co.; William O. Vilter of the Vilter Manufacturing Co.; Thomas F. Howe, president of the Milwaukee Refrigerator Transit Co. and formerly traffic manager of the Pabst Brewing Co.; E. A. Uhrig, president of the Northwestern Fuel Co.; Capt. David Vance, one of the best known vesselmen on the great lakes; George H. D. Johnson, grain shipper; Capt. H. M. Merryman, member of the New York Shipmasters' association; A. E. Snuggs, general agent of the Pere Marquette railroad system; Joseph Goldbaum, secretary-treasurer of the Pere Marquette Steamship Co.; Capt. F. H. Magdeburg; E. T. Wheelock, editor of The Sentinel, and Julius Bleyer, editor of the Evening Wisconsin.

Frank G. Bigelow asserted that the business men favored aid to the shipping interests, if it could be done in a way that would appeal to the fairness of the people. He declared that if ocean freighting were made profitable, capital would be glad to invest in it.

Julius Bleyer read a paper on "The Evolution of Lake Shipping," and after giving a history of the growth of the lake marine, said in part:

"The sympathy of the general public being in favor of assisting our languishing merchant marine engaged in the foreign trade, the question before you is whether it is possible to extend assistance sufficient to overcome the heavy handicap, and if so to ascertain how the assistance shall be extended. I have followed the hearings of your honorable commission with great interest, and have noted the points that have been raised and the arguments that have been advanced. In my humble opinion, Mr. Thomas Clyde of the Clyde line of steamers stated the proposition succinctly at your New York hearing. As it costs from 30 to 40 per cent. more to build a ship here than abroad, he suggested a construction bounty to offset this difference. As the cost of operating an American ship is about 30 per cent. more than the cost of operating a foreign ship, he suggested an operating bounty or subsidy; and as speed is expensive, he suggested a mail service bounty. These views are in accord with my own. It has been said that the extra cost of the American ship would not deter investment in shipping for the foreign trade if the cost of operating the American ship were not higher than the cost of operating foreign ships. This is probably true; but a subsidy plan might be made to comprehend an interest return for a fixed period—an annual rebate large enough to pay a nominal rate of interest on the extra investment, plus a percentage for depreciation. Roughly, a rebate representing a 4 per cent. rate of interest on the extra capital and a 5 per cent. rate on the same extra capital to cover depreciation ought to put an American investor on an even footing with the foreigner so far as the ship is concerned. If a rebate of this kind were provided, it could be limited to a fixed term of years, as it is possible that with a revival there would be established gradually a systematic standardization of hulls, like that which has obtained in the shipbuilding trade of Great Britain, and in consequence ships might eventually be built as cheaply on this side of the Atlantic as in foreign yards. This element of the proposition is within the scope of the protective tariff idea—that of building up struggling industries.

"The problem of extra cost of operation is one that will probably resist ultimate solution. It cannot be solved unless American wages decline to the level of European wages, or foreign wages increase to the level of American wages. As neither of these changes are within the bounds of rational expectation, the disadvantage in the matter of operation must be regarded as permanent. As the aim of protection to American industries is to provide a barrier against the foreign competitor equal in height to the difference between foreign and American wages, a rebate is suggested in the case of shipping, based upon a close estimate of the percentage of increased cost of operation. For instance, after a vessel owner had presented his statement as to cost and received his annual rebate in interest upon the extra capital invested, plus an allowance for depreciation, he could be allowed a rebate based upon his expense account for the year, or a rebate per head based on this showing as to the number of men employed during the year and the number of days of employment. This would keep the subsidy or rebate down to actual losses, and obviate payment by the government for the time during which ships are lying idle. It seems to me that assistance could be extended in this way without danger of overpayment in any case. Besides, a tonnage rebate system, and a wages rebate system could be understood by the average taxpayer, and would therefore be viewed with less suspicion.

"The mail service bounty could be extended on the principle upon which compensation for mail train service is based. Speed is costly, and in order to insure it a liberal price should be paid the mail service. It has been stated that the railroads get $8.10 from the general government for carrying mail matter whose weight does not exceed in amount that of freight which is carried for the express companies for $2.43½. In other words, it is said that the government pays three times as much for carrying the mails as the railroads charge the express companies for the same service. If this be true, the difference can be said to represent the premium paid for the rapid carrying of the mails. If this is allowable in the mail service on the railroads it ought to be fair to pay a high rate for the carrying of the mails on the seas, in order to stimulate the development of steamship traffic."

David C. Harlowe said that the Allis-Chalmers Co., one of the greatest manufacturers of machinery in the world, shipped extensively to all countries, but that it is difficult to find adequate shipping facilities, especially to Mediterranean, South American and Australasian ports, and that the transfer from

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COAL AWAITING LAKE SHIPMENT AT THE TOLEDO & OHIO CENTRAL YARDS, TOLEDO.

ship to ship which is necessary to reach these ports results in damage to the machinery, and the delays entailed are exceeding costly.

"If we could have direct lines, we could easily build up a much larger trade," said Mr. Harlowe. "With an American ship with American officers, there would be less delay and much less breakage. We already have evidence of this, for on the Pacific we have less trouble, where the American railroad companies are directly interested in the lines."

Capt. David Vance said he thought a large majority of the people would favor government aid, provided it could be done in a fair and reasonable manner. In response to a question of Congressman Minor of Wisconsin, a member of the commission, he declared that the large freighters, such as ply on the lakes, if given the advantage of quick loading and unloading, such as lake ports give, would reduce ocean carrying charges.

E. A. Uhrig told of the saving of time by modern unloading devices and said that American soft coal companies now are considering a plan to install these devices at foreign ports, to prevent delays. George H. D. Johnson opposed subsidies, and thought foreign nations might be willing to abrogate all such bounties by international agreement. Capt. H. M. Merryman told of efforts made by over 200 New York and Philadelphia vesselmen in 1874 to obtain a government subsidy, but declared that they failed.

"A direct subsidy is the only thing which can save our shipping," he declared. "The discriminating duty plan would fail because it would not save the cotton trade, and because it would only give a bounty on exports. Many ships make the westbound trip in ballast, and they would get no benefit from this plan."

E. T. Wheelock favored a discriminating duty policy with subsidies and mail bounties to lines which would not be built up by the first plan. He declared that American shipping is as much entitled to protection against foreign competition as any industry on land. Thomas F. Howe declared that the beer business needed better export facilities.

"The foreign market for our breweries can not be much extended until we have better and more direct lines," he said, "I think if we had subsidized ships, or any other device which would give us more adequate shipping facilities, our breweries could sell carloads where now they sell a few casks. For the benefit of the manufacturers of the country, I would like to see direct lines everywhere. I don't look for any great increase in export business until we have a merchant marine of our own."

"From a small beginning," said A. E. Snuggs, in telling of the car-ferry business, "we have now a fleet of ten car ferries on Lake Michigan, with a capacity of 300 cars daily each way, and moving 100,000 cars per annum. American export business is handicapped by the inability of our exporters to make proper contracts for shipping, after the product has reached the seaboard. We have devoted all of our energies to developing fast freights on land, but when we reach the ocean everything must take its time."

"From our hearings so far, it is safe to say that the public opposes direct subsidy legislation," said Senator Gallinger after the hearing. "There has been no opposition to the plan of extending the system of mail subsidy or subvention which already has given us a number of lines. We have received many good suggestions in our hearings on the Great Lakes, and are much encouraged by the manifestations of interest expressed by western men in the building up of the American merchant marine."

Senator Quarles and Congressmen Stafford and Otjen of Wisconsin took a deep interest in the session.

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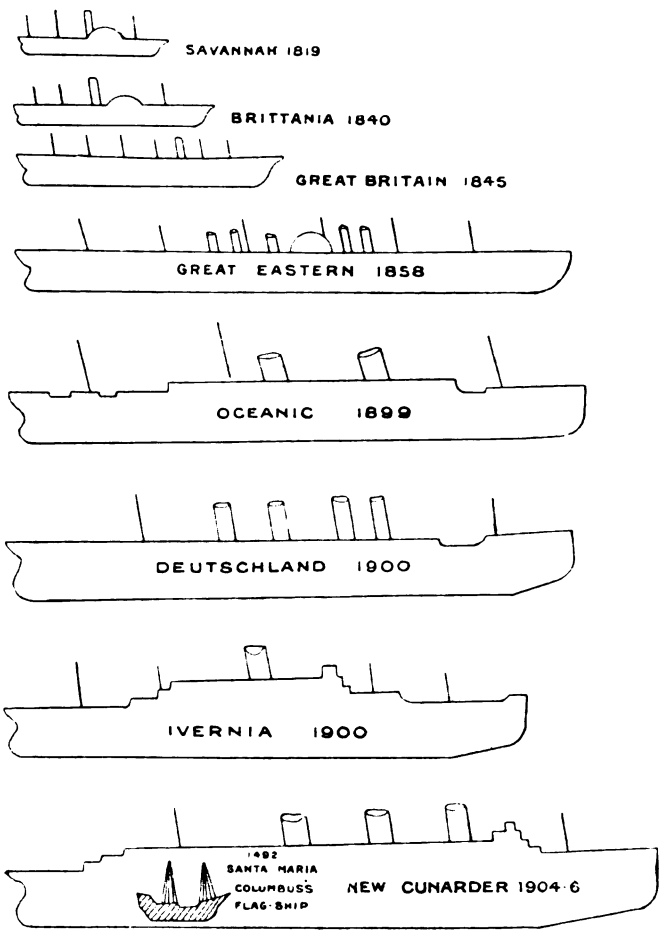
## THE NEW CUNARD FLYERS.

Albert G. Hood in the Mid-Tyne Link.

The Exchange Telegraph Co. was recently officially informed by the directors of the Cunard Steamship Co. that they had placed the orders for the two fast steamships they are building under their arrangement with the British government, one with Messrs. Swan, Hunter & Wigham Richardson, Ltd., of Wallsend and Walker, and the other with Messrs. John Brown & Co., Ltd., of Clydebank and Sheffield. Ever since it became publicly known, nearly two years ago, that the Cunard company had entered into an agreement with the government whereby the company would build two




FROM THE SAVANNAH TO THE CUNARD TURBINE FLYERS.

new Atlantic greyhounds to wrest the blue ribbon of the Atlantic from the Germans, speculation has been rife as to what firms of ship builders would have the honor of constructing these magnificent vessels. The Clyde, the Tyne and Barrow were all anxious to secure the contracts; but from the outset it was believed that the Tyneside company stood a good chance of being awarded one of the contracts. The official intimation that this anticipation has been realized came as welcome news to the people of Wallsend and neighborhood, for ship building on the Tyne during the past few months has been none too brisk. The building of the liner will occupy two and a half years, and the total work involved will probably be greater than that entailed in the construction of a first-class battleship.

The placing of the orders for these leviathans marks an epoch in the history of naval construction, and more particularly of the navigation of the Atlantic, and therefore a brief retrospect at this stage may not be without interest. It was in 1492 that Columbus made the first voyage across the unknown and perilous western ocean in his flagship, the Santa Maria, of 100 tons burden, accompanied by the Pinta and Nina, two frail craft about twice the size of a modern Yarmouth fishing boat. Three hundred and twenty-seven years elapsed before the first steam-propelled vessel essayed a similar journey eastward. The Savannah, a paddle steamer of 350 tons, left the port to which she owed her name on May 19, 1819, and reached Liverpool after a passage of 32 days. As, however, her fuel was exhausted before the passage was accomplished (she burned 10 tons per day) the voyage was made largely with the aid of sail. The Great Western, which may be considered the first practical ocean-going paddle steamer, made her first trip from these shores to New York in 1838, the run being performed in 13½ days. She was of 2,300 tons displacement, and her consumption averaged about 33 tons per day.

Two years later, on July 4, 1840, the Cunard Steamship Co. inaugurated their services across the Atlantic with the wooden paddle steamer Britannia. This vessel was 207 ft. long, 34 ft. 4 in. broad and 24 ft. 4 in. deep. She had a tonnage burden of 1,154, her indicated horse power was 740, her cargo capacity 225 tons; and she was registered to carry 115 cabin passengers, no accommodation being at that time considered necessary for second class or steerage. The average speed was 8½ knots, and the coal consumption was calculated at 38 tons per day. This "far-famed fast American steamer" accomplished the journey from Liverpool to Boston in 14 days, 8 hours, taking with her on the first trip sixty-three passengers. It was in the Britannia that Charles Dickens crossed in 1842, and the opening chapter of his "American Notes" is devoted to a delightfully humorous description of the stateroom which he and his wife occupied—"the pleasantest and most facetious and capital contrivance possible," to have had which one inch larger "would have been quite a disagreeable and deplorable state of things." It is interesting to recall that the building specifications of the Britannia and her three sister ships required that they should be constructed so that, at short notice, they could be utilized for army transport; and thus the Cunard company inaugurated the close connection which has since existed in steam tonnage between the imperial government and the merchant shipping of the country.

The first screw-propelled steamship to cross the Atlantic was the Great Britain, which in 1845 successfully performed the journey from Liverpool to New York in fifteen days. The vessel was built at Bristol in 1843, to the order of the Great Western Steam Navigation Co. She was of iron, and was 322 ft. long by 50 ft. 6 in. beam by 32 ft. 6 in. depth, and measured 2,984 tons. Her machinery developed 1,000 H. P., and she was originally rigged with six masts. She was fitted for the conveyance of passengers, having twenty-six single-bedded staterooms and 113 rooms with two beds each, in addition to dining saloons. This creation of Brunel had a six-bladed screw, and was divided into compartments of five watertight bulkheads. The Great Britain, while on her third voyage to America, unfortunately ran ashore near Belfast, but was successfully floated eleven months later. After repairs, she was put into the Australian trade, and finally was converted into a sailing ship. The writer believes that this pioneer screw steamer was afloat until about thirteen years ago.

The year 1858 saw the launch at Milwall of the Great Eastern, also designed by Brunel. This premature and unfortunate vessel was 679.6 ft. in length, 82.8 ft. beam and her depth of hold was 48.2 ft. Her gross tonnage was 18,915 and the net tonnage 13,344. She had six masts and five funnels, and was propelled by a single screw and paddles. The machinery was constucted by the historic firm of James Watt & Co., Birmingham, the total horse power being returned in the book of the Liverpool Registry of that period as 2,600. No steamship built exceeded the Great Eastern in length until

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the White Star liner Oceanic left the Belfast yard of Messrs. Harland & Wolff in 1899.

A notable Atlantic vessel was the Scotia, 3,871 tons gross register, which, with engines of 4,900 H. P., steamed 14.4 knots, her record for the voyage from Liverpool to New York being about 8 days, 22 hours. The Scotia, which was launched in 1862, was the last paddle steamer built by the Cunard company. Five years afterwards, with the steamer Russia, of 2,400 gross tons, the same company demonstrated the efficiency of the screw propeller as compared with the paddle by steaming 13 knots on a coal consumption of only 90 tons per day, while the Scotia, with her paddles, was burning 150 tons per day to achieve the same speed. In 1871, the White Star liner Oceanic—first of that name—commenced plying across the Atlantic, and soon occupied a leading position. The Servia, the first of the Cunard fleet to be built of steel, was launched in 1881; and the same year saw another notable link in the chain of evolution, the Allan liner Parisian, one of the first vessels to be fitted with bilge keels. The ever-popular Umbria and Etruria followed in 1884, each with a speed of 20 knots. These Cunarders were in 1889 eclipsed in size by the splendid Teutonic and Majestic, of the White Star Line. With the advent of the yacht-like City of Paris (1889) and City of New York (1888), we saw the first twin-screw Atlantic liners, and the Atlantic passage reduced to less than six days. The Cunard sister-ships Campania (launched 1892) and Lucania (launched 1893), with their speed of 22 knots, soon lowered the Atlantic records to a few hours over five days—records which are yet unbeaten by British-owned steamers.

Of the more recently built Atlantic greyhounds, the White Star Oceanic is 685.7 ft. long, 68.3 ft. broad and 44.5 ft. deep, and her speed is returned at 21 knots. In regard to speed, she therefore falls somewhat short of the Campania and Lucania. The famous Kaiser Wilhelm II, built in 1902 for the North German Lloyd Co., is 678 ft. long, 72 ft. wide and 44 ft. deep. Her speed, according to the official information given by Lloyd's Register, is 23½ knots. The Hamburg-American Co's Deutschland, the vessel which at present holds the Atlantic speed records, is 660.9 ft. long, 67.3 ft. beam and 43 ft. deep, her speed being 23½ knots. The largest steamer ever constructed on the North-East coast, the Cunarder Ivernia, built at Wallsend in 1900, is 582 ft. long, 64.9 ft. broad, and 43.5 ft moulded depth; the Leyland liner Hanoverian, turned out from the Hebburn yard of Messrs. R. and W. Hawthorn, Leslie & Co. in 1902, being the next largest.

The full particulars of the new Cunard flyer about to be laid down at Wallsend cannot, of course, be made public, but we may mention that the length will be 760 ft., the breadth 87 ft. 6 in., and the depth moulded over 600 ft. Local readers versed in ship building will have conveyed to them a more accurate idea of the size of the mighty liner than can be given by the recital of the foregoing figures, when it is pointed out that, in the very unlikely event of our city fathers in a future desiring to transport the Earl Grey Monument to New York, the dimensions of the new vessel will be such that the monument may be stowed say in the forward stokehold, and the figure standing on the capital of the column will be able to look over the captain's shoulder as he examines the compass on the top of the wheelhouse; the total height of the monument, from the base to the head of the figure being 133 ft. This latest addition to the Cunard fleet will have accommodation for a grand total of about 2,000 first, second and third class passengers and crew. A speed of 24 to 25 knots an hour is guaranteed, which will in ordinary Atlantic weather enable her to traverse the distance of about 2,900 miles from Daunts Rock Lightship (Queenstown) to Sandy Hook Lightship (New York) in rather less than five days.

A noteworthy fact in connection with the liner is that she will be fitted with turbine propelling machinery, on the Parsons' Marine Steam Turbine Co.'s principle, to be constructed by the Wallsend Slipway & Engineering Co. The committee of experts appointed by the Cunard company some months ago to consider the question of the engines for the new vessels, after exhaustive research, reported in favor of turbine engines against those of the reciprocating type. Such a decision may be regarded as a triumph for the turbine, as the horse power of these engines will be enormously in excess of that developed by the machinery supplied to the new Allan liners, or any of the other mercantile or war vessels now being engined on Messrs. Parsons' principle.

From the foregoing it will be seen that the new Cunarder will be the largest and most important craft ever put into the water from a Tyneside yard, and indeed from any ship yard; and the reputation of the River Tyne as a ship building center will be greatly enhanced by the building of such a liner. In the past the Tyne has been responsible for many successful vessels—battleships, cruisers, destroyers, icebreakers, cable steamers, vessels for the conveyance of frozen meat and fruit, specially equipped colliers and cargo steamships of great size—and now Swan, Hunter & Wigham Richardson, Ltd., will, we trust, add to their notable and varied record in naval architecture the successful construction of an Atlantic mail and passenger vessel which, with her Clyde-built sister-ship, will be greatly in advance of anything afloat.

## TRIAL TRIP OF GENERAL McCLELLAN.

The new steamer General McClellan built by the Gas Engine & Power Co. and Chas. L. Seabury & Co. consolidated at Morris Heights, N. Y., for the dock department was given trial trip on the Hudson river last week, and as all the conditions imposed in the contract have been satisfactorily complied with, the boat has been accepted by the department. This new vessel is 50 ft. in length, with 10 ft. 8-ins. beam, and draws 5 ft. 4 ins. of water. She is a trunk cabin steamer with pilot house forward. The boat is very strongly built, and the materials used in her construction are yellow pine for the hull planking, with deck beams of white pine. All clamps, keelsons and plankSheer are of white oak, with white pine deck planking. Watertight bulkheads are arranged fore and aft. The interior of pilot house is fitted with seats at the sides, and the finish is in white ash and cherry, with floor of white pine. The trunk cabin aft is finished in a similar manner. For the crew there are lockers and berths provided in the forecastle. The after cabin is fitted with transom seats at the sides, and windows in this compartment are arranged to raise and lower into pockets at the sides of the house. Toilet and lavatory service is also provided. The machinery in the boats consists of one compound vertical engine with cylinders 6 in. and 12 in. by 9 in. and Seabury water-tube boiler of latest pattern. The finishing touches are now being put on the boat by the builders.

Capt. J. H. Andrews, one of the pioneer masters in the Lake Superior trade, who has, during the past ten years, been living in Florida, visited Cleveland last week. Capt. Andrews sailed the lakes for over fifty years and in a recent issue of the Review related the experience of his early days. He started in 1843 and quit in 1893. The schooner Nellie Redington, of which he was part owner, was the last vessel which he sailed. Though Capt. Andrews is over seventy-five years old he is still active and intends to take a pleasure craft from New York to his home upon his return.

The tug Nellie J., owned by the Fall Lake Lumber Co., was sunk July 18 by running on a rock a little above Winton, Minn. The boat is thirty-six years old and is said to be the first boat owned by the Standard Oil Co. She will be raised by divers.

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## ENGINE AND BOAT MANUFACTURERS.

The National Association of Engine & Boat Manufacturers recently organized and incorporated under the laws of the state of New York will prove not alone a great power but help as well in the engine and boat manufacturing industry. The objects of the association in part are as follows: To bring forward the new and improved methods in construction; to protect, promote and advance the interests of all who may become members, either as manufacturers or sellers of engines, boats and motors of all kind and description and accessories thereto and as journalists, devoted in all or part to the interests of engines, motors or boats and allied and kindred industries to secure special freight rates; to have a bureau of information; to make special arrangements and participate in shows; to protect its members against adverse legislation and questionable advertising schemes; to take such action as will be in the interests of its members as regards alcohol as a fuel and any other matters that may present themselves from time to time. Those eligible to membership are the representatives of any copartnership or corporation in good standing, who may be engaged in the manufacture of parts of engines, motors or boats, or accessories thereto and as associate members, those journals who may be devoted in whole or part to the interest of engines, motors or boats, as well as those engaged in the manufacture of accessories, etc. The interest that has manifested itself among the members assures for the association a great future and success is already assured. Many of the members have traveled great distances to New York city in order to be present at the meetings of the association and those who could not attend in person were always represented by proxy. The leading manufacturers throughout the United States have already connected themselves with this association and many there are who have sent in their applications to be acted upon at the next meeting of the executive committee. The benefits to be derived from an association of this kind are many and the manufacturers who have not as yet joined have noted this and are coming into the association. The officers of the association are as follows: President, Mr. John J. Amory; first vice president, Mr. H. A. Lozier Jr.; second vice president, Mr. J. N. Schoonmaker; third vice president, Mr. H. R. Sutphen; treasurer, Mr. J. S. Bunting; secretary, Mr. Hugh S. Gambel. The executive committee, to serve three years, Messrs. John J. Amory, H. A. Lozier Jr., J. S. Bunting, H. Newton Whittelsey, J. N. Schoonmaker. To serve two years, Messrs. S. J. Matthew, A. Snider, H. H. Brautigan, A. E. Eldridge, H. R. Sutphen. One year, Messrs. J. B. Smalley, C. L. Altemus, C. L. Snyder, E A. Riotte, A. Massenet.

The active membership comprises at this time the following: C. B. Allen, representing the Mianus Motor Works, Mianus, Conn.; C. L. Altemus, representing the Delaware River Motor Co., Philadelphia, Pa.; John J. Amory, representing the Gas Engine & Power Co. and Chas. L. Seabury & Co. Consolidated, Morris Heights, N. Y.; A. Barrett, representing A. Barrett's Son, Camden, Me.; H. H. Brautigan, representing Bridgeport Motor Co., Bridgeport, Conn.; J. H. Brewster, representing Motor Engine Co., Staten Island, New York city; J. S. Bunting, representing Smith & Mabley Mfg. Co., New York city; A. H. Chase, representing the Chase Pulley Co., Providence, R. I.; Henry Devlin, representing the Penna. Iron Works Co., Philadelphia, Pa.; A. E. Eldredge, representing the Milton Point Ship Yard, Rye, N. Y.; E. Gerry Emmons, representing E. Gerry Emmons Corporation, Swampscott, Mass.; G. E. Hammond, representing the Eagle Bicycle Manufacturing Co., Torrington, Conn.; J. W. S. Harding Jr., representing Spaulding Gas Engine Works, St. Joseph, Mich.; F. W. Heimick, representing the Pearson Boat Construction Co., Duluth, Minn.; W. E. Jakway, representing the Cushman Motor Co., Lincoln, Neb.; F. H. Lacy, representing Lacy Brothers, Toledo, O.; H. A. Lozier Jr., representing the Lozier Motor Co., New York city; K. W. Mansfield, representing the Toquet Motor Co., Saugatuck, Conn.; A. Massenet, representing Panhard & Levassor, New York city; S. J. Matthews, representing Matthew Boat Co., Bascom, O.; L. J. Monshan, representing Termaant & Monahan, Oshkosh, Wis.; Frederick S. Nock, E. Greenwich, R. I.; E. E. Palmer, representing Palmer Brothers, Cos Cob, Conn.; R. W. Perkins, representing the Isham Co., Norwich, Conn.; A. J. Pierce, representing the Pierce Engine Co., Racine Junction Station, Wis.; E. A. Riotte, representing the Standard Motor Construction Co., Jersey City, N. J.; J. N. Schoonmaker, representing the Charles A. Strelinger Co., Detroit, Mich.; J. B. Smalley, representing the Smalley Motor Co., Bay City, Mich.; F. A. L. Sneckner, representing the Stamford Motor Co., Stamford, Conn.; A. Snyder, representing the Buffalo Gasoline Motor Co., Buffalo, N. Y.; C. L. Snyder, representing the Wolverine Motor Co., Grand Rapids, Mich.; George Stelz, representing the N. Y. Kerosene Oil Engine Co., New York city; H. R. Sutphen, representing the Electric Launch Co., Bayonne, N. J.; John M. Sweeney, representing Outing Boat Co., Chicago, Ills.; J. M. Truscott, representing the Truscott Boat Manufacturing Co., St. Joseph, Mich.; E. C. White, representing the White Craft & Power Co., Port Richmond, N. Y.; H. Newton Whittelsey, representing the Standard Boat Co., Long Island City, N. Y.

The associate members are as follows: F. Comstock, representing the Norwalk Brass Co., Norwalk, Conn.; Frederick M. Crossett, representing the Nautical Gazette, New York city; H. F. Donaldson, representing Automobile, New York city; C. D. Durkee, representing C. D. Durkee & Co., New York city; H. S. Gambel, representing Motoring & Boating, New York city; W. S. Logue, representing the Edison Manufacturing Co., New York city; H. G. Mears, representing William Roche, New York city; J. S. Negus, representing T. S. & J. D. Negus, New York city; A. Patterson, representing Rudder, New York city; J. J. Priell, representing Motor Boat, New York city; Frank Remy, representing Remy Electric Co., Anderson, Ind.; D. A. Richardson, representing Richardson Engineering Co., Hartford, Conn.

## STEAMSHIP PRINZ EITEL FRIEDRICH.

The Vulcan Works at Stettin recently launched the steamship Prinz Eitel Friedrich for the North German Lloyd Steamship Co. The new steamer is 508½ ft. between perpendiculars, 489 ft. on the water line, 55 ft. 5 in. beam and 35 ft. 3 in. deep. With a draught of 25 ft. the vessel has a displacement of 14,200 tons. The vessel is built entirely of German materials to the highest class of the Germanic Lloyd for the East India service, and being constructed also as an auxiliary cruiser the main and auxiliary steering engines have been placed under the water line. The double bottom is subdivided into cells and the ten bulkheads reach to the upper deck. The vessel should remain afloat with two adjoining compartments full of water to a depth of 25 ft. The keel is flat and the bilge keels run about half the length. The four decks are especially lofty to insure the comfort of the passengers in the tropics. A complete modern gymnasium has been fitted up on the boat deck. A dining room for 100 persons, a smoking room and a children's room are situated on the promenade deck. The first class cabins for one, two, three and four passengers and also for the officers, are on the promenade deck. Accommodations have been provided for 114 first-class passengers, and sixteen cabins for fifty-two more passengers can be added. The vessel can accommodate 158 second class passengers, and 57 cabins for two, three or four persons. The accommodations for third class passengers, cabins for fifty and bunks for 564 persons

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suffices for 614 persons altogether, so that with a ship's complement of 200 men, the vessel may carry 1,138 persons.

Power is provided by two vertical quadruple-expansion engines of the Hommer type balanced on the Schlick system and supplied with steam from two double and three single boilers mounted in two watertight compartments and working under Howden's forced draft.

## WOLVIN'S REMARKABLE UNLOADING RECORD.

Whatever may be the earning record of individual vessels on the great lakes during the present season, that of the Augustus B. Wolvin will undoubtedly be fair notwithstanding the low rates prevailing. The career of the Wolvin up to date is certainly that of the ideal tramp, for her movements have been more variable than those of the ordinary steamer. When she was launched at Lorain she took on 9,904 tons of soft coal for Duluth. Then she went to Two Harbors and took 9,727 gross tons ore to Buffalo. From there she proceeded to Milwaukee with 10,569 net tons of hard coal and then went light to Escanaba. At Escanaba she loaded 10,973 gross tons of ore for South Chicago and then went to Duluth light. Then she loaded 9,945 gross tons of ore for Conneaut. With this latter cargo she was drawing when she left Duluth 18 ft. 10 in. forward and 19 ft. 3 in. aft. Of course, she was drawing something less than this when she reached the rivers owing to her consumption of fuel. She drew 20 ft. in her record cargo of 10,973 gross tons of ore from Escanaba to South Chicago. Her cargo record to date is therefore as follows:

9,904 net tons, 1,800 lbs. soft coal Lorain to Duluth.
9,727 gross tons iron ore Two Harbors to Buffalo.
10,569 net tons hard coal Buffalo to Milwaukee.
10,973 gross tons iron ore Escanaba to South Chicago.
9,945 gross tons iron ore Duluth to Conneaut.

The Wolvin in her last trip to Conneaut established what is likely to be the unloading record for ore for some time. Her cargo of 9,945 gross tons was unloaded in precisely 4 hours and 30 minutes by four Hulett clam-shell machines and two Brown electrical machines working together. The Wolvin has been at Conneaut since Friday night but was compelled to wait her turn until Monday morning. At 7:20 o'clock Monday morning the eight buckets began working over her and at just 11:52 o'clock the last bucket was hoisted from the hold and the whistle of the big steamer signaled for clearing. She had been completely unloaded without any hand labor whatever. No such work has ever been done before on the great lakes. The nearest approach to it is the record of the James H. Hoyt when 5,200 tons of ore were taken from that steamer by the four Hulett machines in 3 hours and 52 minutes. The Hoyt, like the Wolvin, has her hatches spaced 12-ft. centers.

The Toledo cargo record for coal was broken last week also by the steamer D. M. Clemson of the Provident Steamship fleet which loaded 8,441 tons 1,700 lbs. of soft coal, giving her third place in lake cargo records. Following are the cargo records to date.

Iron Ore—Steamer Augustus B. Wolvin, owned by Acme Steamship Co., A. B. Wolvin, Duluth, manager, 9,945 gross tons or 11,138 net tons, Duluth to Conneaut; steamer Augustus B. Wolvin, owned by Acme Steamship Co., A. B. Wolvin, Duluth, manager, 10,973 gross tons or 12,285 net tons, Escanaba to South Chicago. Steamer Wm. Edenborn, owned by Pittsburg Steamship Co., Harry Coulby, Cleveland, manager, 8,807 gross tons or 9,864 net tons, Escanaba to South Chicago. Steamer Sahara, owned by Globe Steamship Co., G. A. Tomlinson, Duluth, manager, 8,411 gross tons or 9,420 net tons, Duluth to South Chicago.

Grain—Steamers J. H. Reed and D. G. Kerr, Provident Steamship Co., A. B. Wolvin of Duluth, manager, 275,000 bu. of wheat each, equal to 8,250 tons (2,000 lbs.), Duluth to Buffalo; steamer D. M. Clemson, Provident Steamship Co., Harry Coulby, Cleveland, manager, 336,365 bu. of barley, equal to 8,073 tons, Duluth to Buffalo; steamer Rensselaer, Pittsburg Steamship Co., Harry Coulby, Cleveland, manager, 151,000 bu. of wheat, 94,000 bu. barley and 55,155 bu. of oats (300,155 bu. in all), equal to 7,668 tons, Chicago to Buffalo; steamer Mataafa, Pittsburg Steamship Co., Harry Coulby, Cleveland, manager, 185,399 bu. of corn, 40,000 bu. of rye and 43,600 bu. of wheat (268,000 bu. in all), equal to 7,619 tons, Chicago to Buffalo.

Coal—Steamer Augustus B. Wolvin, owned by Acme Steamship Co., A. B. Wolvin, Duluth, manager, 10,569 net tons of anthracite, Buffalo to Milwaukee; steamer Augustus B. Wolvin, owned by Acme Steamship Co., A. B. Wolvin, Duluth, manager, 9,904 tons, 1,800 lbs. of bituminous, Lorain to Duluth; steamer Sahara, owned by Globe Steamship Co., G. A. Tomlinson, Duluth, manager, 8,906 tons, 200 lbs. soft coal, Lorain to Duluth; steamer James H. Reed, owned by Provident Steamship Co., A. B. Wolvin, Duluth, manager, 8,029 tons, 1,400 lbs. of soft coal, Toledo to Duluth.

## CRUISING RACE FROM CHICAGO TO MACKINAC.

The longest cruising race for the largest prizes ever given in the west will be sailed on Aug. 3 by the Chicago yacht club from Chicago to Mackinac. Besides silver cups to the winners in each of the schooner, sloop, and yawl classes, and a prize for the best kept log book, offered by the Chicago club, the Mackinac yacht club has hung up a purse of $1,000 in gold to be divided among the winners. The course is 331 miles in length, 1 mile longer than the New York yacht club's course from Sandy Hook to Marblehead. The start will be at 5 P. M. Aug. 3. Vessel captains are requested to note the names of any yachts they may encounter en route, and report name and location to the Chicago yacht club by telegraph, charges collect. Yachts will fly their signal flags by day. The interest in the race is so general that the course of many passenger steamers will be changed to give their patrons a view of the race. The following yachts have entered:

SCHOONERS.

| Signal. | Name. | Owners. |
|---|---|---|
| CKAV | Mistral | Dwight Lawrence |
| CKAU | Hawthorne | John McConnell, Geo. O. Clinch and Charles E. Fox. |
| CKAT | Alice | Ogden McClurg and H. H. Wait. |

SLOOPS.

| | | |
|---|---|---|
| CMAE | Vanenna | Wm. F. Cameron. |
| CMAF | Vencendor | Fred A. Price. |
| CLAZ | Siren | Alex Stewart, Murdoch MacLeod and F. J. Canty. |

YAWLS.

| | | |
|---|---|---|
| CLAX | Nahma | Fleet Capt. Campbell and Dr. Elliott Carpenter. |
| CLAD | Arcadia | Rear Commodore Wm. L. Baum and Alex. Robertson. |
| CMAD | Tannis | Jno. B. Berryman. |
| CLAW | Naiad | Fayette F. Soule, Chas. E. Soule, Jr. and Fred W. Hill. |
| CMAG | Windward | Paul Springer. |

Yawls Navaree of the Milwaukee yacht club, Coloma of the Macatawa yacht club, and the sloop Neva of the Columbia yacht club are also entered.

Bennett & Schnorbach, Muskegon, Mich., who are moving the breakwater at Racine Harbor, Wis., have one-half the cribs raised and expect to complete the moving of them this year. They have eight divers working continually upon this work.

Fire broke out under the ways of the battleship New Jersey at the yard of the Fore River Ship & Engine Co., Quincy, Mass., last week, but was put out without damage by the fire department of the yard.

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DEVOTED TO EVERYTHING AND EVERY INTEREST CONNECTED OR ASSOCIATED WITH MARINE MATTERS ON THE FACE OF THE EARTH.

Published every Thursday by

The Penton Publishing Company,

CLEVELAND, OHIO.

CLEVELAND: WADE BUILDING.
CHICAGO: MONADNOCK BUILDING.
DETROIT: HAMMOND BUILDING.
NEW YORK: 150 NASSAU STREET.

*Correspondence on Marine Engineering, Ship Building and Shipping Subjects Solicited.*

Subscription, $3.00 per annum. To Foreign Countries, $4.50.
Subscribers can have addresses changed at will.

The Cleveland News Co. will supply the trade with the MARINE REVIEW through the regular channels of the American News Co.

Entered at the Post Office at Cleveland, Ohio, as Second Class Matter.

JULY 28, 1904.

Capt. W. Irving Adams of East Boothbay, Me., recently celebrated the launching of the 100th vessel from his yard. The vessel was, of course, a schooner for the coasting trade and it was eminently proper that the event should be celebrated, for it is not every individual ship builder who lives to complete his hundredth vessel. The speeches were many and significant, but probably the most important utterance of all was the following letter from Congressman Littlefield of Maine:

"It is certainly a fitting occasion for calling attention to our merchant marine, and especially the existing decadence of our foreign-going merchant marine. Industries like that represented by Capt. Adams are becoming very few and far between on our coast. It is no doubt true that steamers are to a large extent, so far as over-sea commerce is concerned, taking the place of sailing vessels, and it may be true that this development is necessarily incident to changing conditions. It is a source of great regret that we are being practically eliminated from the carrying trade of the world, especially so at a time when our foreign commerce is increasing very rapidly, and is vastly greater than ever before in our history. I believe that it is essential to our permanent commercial and industrial development that the ship building, ship owning and ship sailing industry should receive the most careful attention, to the end that we may be able to regain our proper place among the maritime nations of the world. It is neither wise nor safe for us to be obliged to depend for the transportation of our products to foreign countries upon a foreign merchant marine.

"Every well informed man realizes that a large merchant marine is an indispensable foundation for a large and efficient navy. We have made tremendous strides in the last two decades toward a large navy, and during that time our merchant marine has been gradually decreasing and dwindling.

"A great difference of opinion exists as to the causes which have brought about these conditions and as to the remedies to be applied. There cannot but be, however, a common agreement upon the part of intelligent and well-informed people as to the necessity of ascertaining the cause and the true remedy. It is a source of satisfaction, however, to know that we still have some enterprising, energetic and successful ship builders like Capt. Adams, who proposes to celebrate in a proper manner his century vessel. May his shadow never grow less, and may his inspiring example be successfully emulated."

The Marine Review submits that there is no issue before the American people today except the shipping question. The money question is not an issue. The gold standard has been irrevocably established and the financial question will not be given a moment's consideration. The country, too, is committed to the fiscal policy of protection and there is no serious intention of adopting any other. The revival of shipping is the only question of importance before the people. It is the first question to be considered when congress meets in December and it is to be hoped that it will be settled before it adjourns. All about and everywhere over the middle west the people are talking about shipping. It is remarkable how much knowledge is being displayed about it. Business men discuss it on the street cars and deplore the absence of American ships from the high seas—not from patriotism or national sentiment, but from hard headed, business reasons, saying specifically that they cannot reach the South American market with their products because there is no communication between this country and South America. Every pound of export destined for the rich countries of South America goes first to Liverpool, where it meets in competition the product of British factories. Does any one pretend to say that the American product is favored over the British product?

It is probably true that more interest is being taken in the shipping question today than has ever been taken before—and it is being taken by the right individual, not the ship builder and ship owner, but the manufacturer and the "man in the street." They are beginning to inquire why it is that a country like this, great in manufacturing and essentially maritime, should have

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no ships; why it is that its great export trade should enrich the coffers of foreign ship owners. They don't have to travel far to get at the reason. It lies in the higher cost of construction and higher cost of operation that obtains in the United States by reason of the protective system. It lies in the fact that other nations subsidized their shipping until trade lanes were established. Great Britain went about it magnificently and fairly threw money away until its steamers were touching at every port in the globe. Has she got it back? Her steamship earnings are her glory. Even the railways of the United States have not in certain years earned more than the ships of Britain. Even the great wheat crop of the United States, which raises to prosperity a considerable portion of our entire population in years of fine yield, is not much greater than the earnings of the great fleets of steamers flying the British flag. But the earnings of the steamers are only part, and a very small part, of the aggregate wealth created. Look at Britain's export trade in manufactures. It is wonderful; but it has been made so simply because her customers have known that she could deliver the products. It is not an idle thing to say that the manufactured exports of the United States would increase one-third had this country the same facility for delivering them that Great Britain has. What would it mean to increase our manufactured exports thus? It would mean huge dividends in the pockets of every person in the United States. No one could escape its beneficence. All would be included—capitalists and laboring man; but the laboring man would get the greater part for a manufactured article is chiefly labor.

It was a good thought to create the Merchant Marine Commission. It has done much to bring this important subject to the attention of the whole people. It has got them thinking and talking. One has only to look over the diverse interests that have appeared before the commission to realize that. Men in all walks of life have testified, and it is not the ship builders and ship owners by any means that have given the most invaluable testimony. The commission is now in the Pacific coast, where it will be for the next two weeks. It will have framed its report by the time congress convenes. Meanwhile the mass of data obtained will be put in readable form for public digestion. The keynote of the report should be: "Don't give up the ship."

## GRAIN SITUATION AT DULUTH.

Duluth, July 26.—Freights to Buffalo have been 1⅛ cents this week with little or nothing doing. There are only about [illegible] bu. of Duluth spring wheat available for shipment [illegible] before new crop comes along unless receipts continue [illegible]. They have improved materially the past week or so, and sales of to arrive by the country continue, but are absorbed in eastern purchases. Of the 970,000 bu. wheat in store here 250,000 are macaroni, and a large part of the rest is sold for eastern mills. These sales are frequent, though in rather small amounts, from day to day.

The grain men of Superior think new steps under the concession rule at Duluth are calculated to force them out of business. That new rules may have the effect of making it hard for men not members of the Duluth board of trade to conduct a grain business at the head of the lake is undeniable, and new firms starting will doubtless be located at Duluth. But of the three active grain firms at Superior two are members at Duluth, and memberships are not hard to get, if one has the price. These memberships have advanced in the past two weeks from about $600 to $1,500 each, and several have been sold at the latter figure. That they are sure to go much higher before long is believed by Duluth grain men. Aside from any trading privilege there is value in the association's property that makes these memberships worth about $2,000 each, and in a couple of years this value will be shown in a change from annual assessments to annual dividends.

The Amenia and Sharon elevator at Superior, of about 50,000 bu. capacity, has been bought by McCabe Bros. of Duluth, who will conduct it as an hospital and private house. They are active receivers on the board of trade and are personally interested in considerable wheat acreage in northern North Dakota.

Nothing is done here in export sales of grain, the local exporters are continually selling a little Manitoba wheat on the other side. With present lake and ocean rates it is possible to put Duluth wheat alongside at Liverpool at about 7 cents, or a shade under. While this is a very low rate it is not especially unusual of late years.

## IRON ORE SHIPMENTS GROWING HEAVY.

Duluth, July 26.—July ore shipments from Minnesota mines will foot up about like this: Duluth, Messabe & Northern docks 000,000 tons, Duluth & Iron Range 675,000 tons, Great Northern 650,000. This will possibly be somewhat under the record for the following month, but there will probably be slight differences. It is evident enough, now that shipments are sure to be far above the early prophesies all along the line, Old Range roads are now quite busy, but are not having any such tonnage offered them as the three Minnesota roads.

There is almost no change in iron conditions and the increased shipments is an evidence that steel people look for a very much more active winter and a good year throughout 1905, so that accumulations of ore on lower lake docks will not be burdensome at the opening of navigation that year. As a general proposition ore men hate to have a lot of stock on hand at lower lakes at the opening of navigation and this heavy shipment for 1904 will surely result in an enormous accumulation if the fall, winter and spring business is not very much above that of the summer.

The Zenith Furnace Co., Duluth, is now making coke and will blow in its 250-ton furnace in a few days. The company is supplying the city of Duluth with gas from its United Otto ovens and will supply Superior also. These sales, though at low prices, will enable the company to make pig iron at an especially low price and insure a great success for the enterprise.

## RIVER CONGESTION AT CLEVELAND.

During the past three or four years, or since the 6,000 and 7,000-ton boat has been common, the river in Cleveland above the Superior street viaduct has become so congested that when two vessels are lying at opposite docks it is impossible for a third vessel to pass them. Vessels have constantly to be shifted and this occasions much delay. The river above the viaduct has become an important shipping center, having three ore docks, two coal docks, a general freight dock and a number of lumber docks. At the request of the vessel owners Mayor Johnson and a number of city officials will take a trip up the river to day (Thursday) to determine what can be done to remedy this condition of affairs.

The little steam barge, Ida, wrecked off the Catawba islands a short time ago, has been abandoned as a total loss.

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## FREIGHT SITUATION ON THE LAKES.

The freight situation has not shown any real improvement during the past week. The wild rate of ore has continued at 70 cents from the head of the lakes, 60 cents from Marquette and 50 cents from Escanaba, but shippers represent that this rate, slim as it is, exists by sufferance only. Season contract rates were made by the Steel Corporation upon a basis of 70 cents from the head of the lakes, 60 cents from Marquette and 55 cents from Escanaba. Other shippers made their season contracts upon a basis of 65 cents from Marquette and the bulk of the ore will be moved from that port at that figure. The Steel Corporation moves very little from Marquette. Nor is the movement from Escanaba very heavy. Lately what are known as low grade ores have been shipped from Escanaba and for these the market is not active. It is expected that when the season's total is computed it will be found that the ranges at the head of the lakes have increased their proportion of shipments. Leading interests are now figuring on a total movement of 17,000,000 tons of ore for the season. When analyzed this is quite as good proportionately as last year's shipments, as the season this year did not begin until June 15 and last year about 17,000,000 tons were moved after June 15. However, dispatch is a great deal better this year than last and this has operated to create an excess of available tonnage. There is no juggling with the fact that the movement this year is not sufficient to care for all the vessels. Small buyers are making more inquiries for ore, but not in sufficient quantity to sensibly affect conditions. However, they are straws which indicate a revival of conditions

Immediately after the opening of navigation coal was rushed to upper lake ports in such prodigious quantities as to literally swamp the docks. The result was a subsequent let-up in shipments and it cannot be said that the docks are yet in good shape. While it is not likely that coal will go forward with anything like the rush that marked the early part of the season it is, however, expected to be steady.

The grain trade shows some signs of awakening and rates are stiffening a trifle. One cent was paid one day during the present week from Chicago.

## FIRE DRILL ON LAKE PASSENGER BOATS.

Ever since the disaster of the General Slocum unusual vigor has been exercised by the steamboat inspection service in inspecting vessels. During the past week the local inspectors at Chicago, Capt. Ira Mansfield and Capt. Royal L. Peck have been putting the crews of various boats through the fire and life boat drill, and the reports taken show the steamers to be well protected. In each case the steamers were boarded without prior notification, but in each instance everything was found up to date. The steamer Eastland which was among the first to be inspected made a remarkable record. From the time the fire alarm was sounded it required exactly 1 minute and 14 seconds to have six streams of water, four from the steam and two from the hand pumps, in complete action and equally good showing was made in lowering one of the life boats into the water from the steamer's hurricane deck. This was accomplished in 2 minutes and 40 seconds. The steamer City of South Haven put six streams of water into full action in 1 minute and 30 seconds, and lowered one of the small boats into the water in 2 minutes and 42 seconds. The steamer H. W. Williams, a much smaller boat, put four streams of water into service in 1 minute and 36 seconds, and the crew occupied 4 minutes and 30 seconds launching one of the steamer's lifeboats. The steamer C. H. Hackley made the most remarkable time in getting its streams of water into play. Four streams from the steam pumps, and two from the hand pumps were in operation in exactly 1 minute and 15 seconds.

The inspectors say tests will be called for at frequent intervals on all boats during the summer, and where there are any irregularities discovered the owner of the craft will be dealt with summarily. Thus far, the inspectors say, the drills have been performed with wonderful celerity and the work is nothing short of marvelous, considering that the crews of these boats are being changed constantly. However, it has become almost necessary that a man employed on shipboard shall know the rules governing the fire and boat drills.

## SHIP CANAL AROUND NIAGARA RAPIDS.

The Manufacturers' Club of Buffalo is actively promoting measures to secure the adoption by the federal government of a more comprehensive plan for a ship canal around the rapids in the Niagara river at Buffalo than the plan presented to the rivers and harbors committee at Washington last March, which was, in effect, simply a widening of the Erie canal through the city of Buffalo to a connection with Lake Erie, with large docks below the city at Black Rock. The new plan advocated by the Manufacturers' Club provides for a ship canal outside the present harbor and shore line of Niagara river along the entire front of the city. This will be effected by the construction of a steel pier bulkhead breakwater along the bed of the river at an average distance of about 000 ft. from the shore line, and paralleling it from the foot of Lake Erie to the foot of Squaw island a short distance below the international bridge—the steel bulkhead or breakwater continuing from that point across the American channel of the river to the head of Grand island, and by the building of a retaining dam so that the depth made by dredging, together with the higher water level produced by the dam, will afford sufficient depth of water for the largest lake vessels, entirely free from dangerous currents.

An extension of the steel bulkhead or breakwater from the foot of Grand island to the American shore at Niagara Falls —opposite Goat island and just below the entrance to the Niagara Falls hydraulic power canal—will make the American channel safely navigable for large vessels to the southern section of the city of Niagara Falls, and afford lake shipping facilities to the many large manufacturing concerns located at the falls and along the entire river front between Buffalo and Niagara Falls, now seriously handicapped by the swift current.

It will provide a winter harbor large enough for the whole lake fleet, sheltered and safe; it will provide deep water for the largest lake vessels, all the way from Lake Erie to Tonawanda without locks or swift currents and very little dredging compared with the so-called Black Rock harbor plan. It will raise the water at Tonawanda 4½ ft. and make Niagara river a feeder for the 1,000-ton barge canal, without using the Erie canal from Buffalo to Tonawanda for that purpose. It will give the 1,000-ton barges entrance into the harbors of Buffalo without any lock this side of Lockport. Congressman Burton, in a letter, stated that he would be in Buffalo the second week in August with a majority of the committee on rivers and harbors to investigate the plan.

The steamer Garonne, formerly owned by the North Alaska Steamship Co., which purchased her about three months ago, has been sold to the Merchants' and Miners' Steamship Co. of New York. The purchasing company will continue the Garonne in the Nome traffic, sailing her again Aug. 15. Among the people behind the new company is William F. King, president of the Merchants' Association of New York city. Frank Waterhouse has been elected president of the company.

The Hamburg-American Steamship Co. is about to add to its fleet a vessel of 25,000 tons, to be built at Stettin, Germany, and another of 22,000 tons, to be built by Harland & Wolff of Belfast, Ireland.

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## PROPERTIES OF LAKE SUPERIOR CORPORATION.

Mr. C. D. Warren, president of the Lake Superior Corporation, recently made an inspection of the works at the Sault and has expressed himself as highly gratified with the condition of affairs as he found them. The steel plant and rail mill are in good condition and are classed as the main industries of the corporation. They hope to have both plants working some time in August. The president and directors of the corporation during their visit concluded contracts which will keep the Helen mine running with an output of from 800 to 1,000 tons a day throughout the season, in addition to such shipments as are made to the steel works of the parent company. The Algoma Central railway, another property of the Superior corporation, was reported by Mr. Warren to have been built as well as the highest standard of American railroads. Similar report was made of the railroad running from Michipicoten harbor to the Helen mine. Mr. Warren further stated that the water power canal and power house on the Canadian side of the Sault are in excellent condition and will be the means of encouraging many industries to locate there. The corporation also owns street railway lines, wood pulp mills, saw mills, machine shop and foundry, chemical plant and nickel plant.

While the reorganization of the industries was in progress Mr. Francis H. Clergue furnished the Ontario government with the following statement showing the condition of the various companies at the time of the consolidation and the original cost of the properties:

The Lake Superior Power Co.—Power development, $283,442.02; power building, $303,110.93; power canal, $200,092.70; compensating works, $288,820.77; power canal No. 2, $22,212.12; Gertrude nickel mine, developed; a part of 75,000 acres of nickel property owned by company in Sudbury district, $273,811.70. Nickel smelters, finished and in operation, etc., one 120-ton and one 220-ton capacity, $42,206.90. Helen iron mine, non-bessemer, Oct. 12, 1903, blocked out and drilled 3,015,200 tons. Siderite deposit represents millions of tons of bessemer ore, $250,100.02. Cariboo copper mine, not developed, $11,040.11; copper nickel reduction, all finished, consisting of sulph. acid, briquetting, roasting, water, gas and oxygen plants, capacity 50 tons ferro-nickel daily, $513,657.28; copper-nickel converting plant, nearly completed. Converter in place and machinery all ready to install, to convert 325 tons of ore per day, $65,320.96. Brick plant, finished and working, capacity 16,000 pressed bricks per day; 5 kilns and 80 furnaces. Clay bank owned by company about 2,000 ft from plant, $102,302.70. Chemical laboratory, one of the finest private laboratories on the continent, $6,929.93. Chemical laboratory equipment, $10,290.60. Docks forming connections with the Algoma Central and Hudson Bay railroad. Vessels of largest type on great lakes can load or unload, $8,300.47. Real estate, comprising a stretch of land (water front) for nearly five miles up the St. Mary's river (Canadian side), and other properties; riparian rights, $432,716.68. Iron range explorations, $50,793.89. Office building, $85,527.76. Tagona Inn, $29,093.96. Miscellaneous buildings and equipment, $27,097.11. Limestone quarry, at Cockburn, in Michigan, $6,103.60. Warehouses, $10,589.63. Steamship Siesta, $22,421.23. Rights to cut pulp wood, transferred to Commercial Co., including camps, equipment, etc., $118,243.03. Total, $3,281,302.60.

The Michigan Lake Superior Co.—Power canal, completed and in operation 2¼ miles long, $3,622,804.54. Power buildings completed and in operation. Develops 44,000 H. P. or 36,000 electrical H. P. 25,000 H. P. sold. Owns a large acreage of land and water front. This land is becoming more valuable as the United States government is increasing its holdings for part and other purposes, $11,717,061.79. Electric transmission line, $23,366.28. Real estate, river front property, extending inland. This property has increased very greatly in value within two years; all within city limits, $217,238.45. Docks, located on St. Mary's river, $34,184.25. Total, $5,065,105.31.

The Sault Ste. Marie Pulp & Paper Co.—Ground wood pulp mill, capacity 80 tons daily, $181,348.40. Ground wood pulp mill—tools and machinery, $327,683.49. Sulphite pulp mill, capacity 60 tons daily, $328,281.89. Sulphite pulp mill, tools and machinery right to cut pulp wood, $217,751.02. Boiler house, $6,077.05. Paper bag mill, in Michigan power building, completed. Also makes building paper, utilizing only waste pulp from both pulp mills for its full capacity, $23,323.81. Warehouse at Sault Ste. Marie, Ont., $16,330.10. Total, $1,100,805.76.

Algoma Iron Works, Machine Shop—Tools and machinery for same. A complete and splendidly-designed shop in every detail and equipment, $67,472.67. Foundry, fully equipped. Kept busy all the time on work for the sub-companies, $67,807.44. Foundry—Tools and machinery. The machine shop, foundry and blacksmith shop are capable of building railroad locomotives or any other engines; exceptional equipment, $4,303.45. Blacksmith shop, works in connection with foundry and machine shop, $13,243.51. Pattern shop is fully equipped with every modern device in the way of tools, etc. Pattern shop—Tools, etc., $12,580.74. Pattern shop—Tools and machinery, cost included in foundry tools and machinery, $12,580.74. Miscellaneous property, $407.12. Total, $205,159.81.

Tagona Water & Light Co. Electrical plant, lights. Towns of Sault Ste. Marie and Tagona, $127,701.88. Water service, towns of Sault Ste. Marie and Tagona. This company is a steady earner, with increasing possibilities as towns grow, $245,554.70. Total, $373,256.58.

The Algoma Commercial Co., Ltd.—Josephine iron mine, not entirely developed, seven analyses show iron 63.78, sulp. .209, phos. .023; two ore bodies, one Bessemer and one non-Bessemer; drills indicate a rich deposit; two drills have been worked, $111,203.41. Frances iron mine, "Identical with Vermilion Range formation," $75,370.64. Grace gold mine, developed 1,500 ft. of shafts and drifts, $133,890.27. Emily gold mine, undeveloped, but all indications point to richer deposit than in Grace mine, $18,849.04. Elsie nickel mine, developed and productive, $100,245.49. Woodbridge iron mine, undeveloped, located in Mesabi district; 3,000,000 tons measured up, $119,073.42. International dock and railway terminals and hotel, railway terminal site for Union Station to be used by Algoma Central, Manitoulin & North Shore Railway Co., $93,519.18. Sault saw mill dock, loading station for lumber; this dock holds 3,000,000 ft. of lumber; another dock must be built to hold extra lumber, $14,888.78. Michipicoten hotel, Algoma inn, $14,067.36. Tagona inn equipment, hotel owned by Lake Superior Power Co., $6,527.91. Veneer mill, in full operation, turning out 80,000 square feet per day; all product sold ahead, $112,483.00. Sault saw mill, in full operation, product all sold, cutting 30,000,000 ft. lumber a year, $142,564.30. Real estate, franchises, etc., increasing materially in value daily, $435,716.18. Land grants—Algoma C. & H. B. R. R., 673,400 acres earned subject to conditions; 814,000 acres more will be earned when railway is completed from the Sault to Josephine Junction, and when completed to Missinabie 185,000 additional; total, 1,672,400 acres, $412,065.69. Manitoulin & North Shore R. R., 90,000 acres earned, subject to conditions. Investments at Michipicoten, consisting of buildings, warehouses, docks, etc., also at Searchmont, and at Goulais, of saw mills, etc., $61,850.83. Logging operations, supplies timber to pulp mills, saw mills, veneer mills, charcoal retort plant and kilns, etc., $180,847.64. Total, $2,126,238.23.

The Algoma Steel Co., Ltd.—Bessemer steel works, 750 tons Bessemer ingots per day, $2,277,181.36. Blooming and rail mill, 1,000 tons per day, dependent upon capacity of blast furnace at present, $155,734.27. Charcoal blast furnace, 150 tons per day; constructed to use either coke or charcoal with

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equal efficiency. Coke blast furnace, 250 tons per day; these two furnaces, with all accessories, such as blowing engines, elevated railroad skips, bins, electrical unloaders are of the latest type, $1,805,316.22. Charcoal retort and by-product, the finest and largest in the world; the product is 1,600 gallons, 85 per cent. alcohol, 8,000 bushels charcoal, 240 cwt. gray acetate of lime, daily, $503,197.69. Charcoal kilns, located at Wilde and Searchmont on Algoma Central & Hudson Bay railroad, 56 kilns, daily capacity 4,000 bushels charcoal, $130,020.36. Wharves, at steel plant; these wharves are well built and very extensive with electrical traveling unloaders for ores and coal, etc., $229,414.36. Limestone properties, one located in Michigan at Petoskey, and the other, Bruce Mines, Ont., $7,975.28. Power transmission line, from power house to steel plant, about one mile long, $30,747.03. Residences and cottages, located at Tagona; one hundred and thirty-four cottages and six houses of large size for superintendents; all in excellent condition, $192,339.15. Total, $5,331,925.03.

Algoma Central & Hudson Bay R. R. Co.—Railroad and equipment; over 100 miles in operation, large portion of the balance of the line graded and ties on ground; the road is splendidly built in every way, with concrete culverts, etc. Nineteen locomotives, 200 steel ore cars, 25 gondolas, 23 charcoal, 94 dump, 497 flat, 10 passenger, 36 box, 28 work cars, $8,179,586.61. Steamships and barges, 3 passenger steamers, 1 tug, 4 ore steamers, capacity 9,150 tons, 2 ore barges, capacity 8,000 tons—17,150 tons, total, $837,710.66. Car shops, at Sault Ste. Marie; capacity, 7 flat or 6 box cars per day. Total, $9,017,297.27.

Manitoulin & North Shore R. R. Co.—Railroad, 14 miles constructed from Sudbury to Nickel Mines; this road uses rolling stock belonging to the Algoma Central & Hudson Bay Railroad. Total, $533,186.95.

Trans. St. Mary's Traction Co.—Street car lines, in full operation; street car lines owning franchises for streets in Sault, Mich.; the two lines are on the American and Canadian sides, and have a mileage of about 16 miles, and operate 15 passenger cars. Total, $217,784.41.

International Transit Co.—Street car lines and ferries. Street car lines in Sault, Ont., and Tagona; also operates ferry between the two Soo's in connection with the street cars; in full operation. Total, $308,744.51.

The British-American Express Co.—Conducting express business on the railroad and steamship lines of the Algoma Central & Hudson Bay Railway Co. and Manitoulin and North Shore Railway Co. Grand total, $28,259,177.06.

Investments in other companies.—The Lake Superior Power Co., $282,600. The Algoma Commerical Co., Ltd., $168,334.24; The Michigan Lake Superior Power Co., $106,184.80. Total, $28,816,296.10.

The material and supplies in hand are valued at $2,699,300.72. The capital stock is stated to be $46,350,000, and the bonds $30,517,572.

## STATE OWNERSHIP OF ORE LANDS

Duluth, July 26.—Reference has frequently been made to the mine interests in northern Minnesota owned by the state as a commonwealth, but the importance of these is scarcely realized. It will not be far out of the way to estimate the amount of ore now shown on state lands at 100,000,000 tons, all of which is under lease to large operating interests. Mining on state lands has never been especially rapid, chiefly on account of the fact that the state's leases are easier, in the matter of minimum outputs, than those of any private owners, and it is easy to hold these lands in reserve. But at this time about 2,000 tons a day are coming off these lands.

State leases are on the basis of 25 cents a ton royalty, in which they differ little from the average of private leases on the Mesabi range, but instead of a minimum output of from 50,000 to 100,000 tons for each 160 acres or fraction thereof contained in a single lease there is a requirement of only 5,000 tons at the maximum, and no payment other than $100 a year for the first five years of lease, and until a railroad is within a mile of the property. If no road is within a mile of the land when the contract is made then five years can elapse after such road is built before more than 1,000 tons need be mined or paid for. The state maintains an inspector who looks after shipments and examines the various leases and contracts outstanding.

At this time only the Pool mine of the Oliver Iron Mining Co., and the Grant of the Interstate Mining Co., are operating on state land. But there are opened the Mitmewas and Oliver of the Oliver Iron Mining Co., the Elizabeth of the Scranton Mining Co., and the Yates and Frantz of the Consumers Ore Co. The last three are new mines. Oliver will probably ship a trifle this year.

## CHICAGO GRAIN REPORT.

Chicago, July 26.—Since last weekly account rates have ranged from ¾ cent to 1 cent basis Buffalo corn. Liners in their special adaptation to various sized lots have controlled quite steadily in engagements at the 1 cent basis. Cargo lots suited to outside vessels are still somewhat unsettled but under the generally improved market tone their engagements are going with fair regularity at ⅞ cent to 1 cent according to character of loading. The export cash situation is about unchanged and rates are nominally 3 cents corn through to Montreal and ⅞ cent to Georgian Bay points. Grain receipts are about meeting with expectations. The substantial movement of wheat, corn and oats from country points stimulating an improved milling business and general betterment in our export position.

The distribution of weekly shipments noted below is about as follows: Via all rail lines of wheat 161,000 bu., corn 228,000 bu. and oats 631,000 bu. Via lake routing to Buffalo and other American points 875,000 bu. corn and 95,000 bu. oats; and via lake routing to Canada points 75,000 bu. corn.

Lake and rail shipments:

| | This week. | Last week. | Same week last year. |
|---|---|---|---|
| Wheat | 108,050 | 147,200 | 209,567 |
| Corn | 1,183,885 | 1,878,098 | 1,849,793 |
| Oats | 724,888 | 980,215 | 1,120,595 |
| | 2,107,723 | 3,005,513 | 3,179,955 |

| | Shipments since Jan. 1, 1904. | Same time last year. |
|---|---|---|
| Wheat | 7,320,537 | 11,901,330 |
| Corn | 35,098,777 | 46,185,788 |
| Oats | 26,064,043 | 37,597,290 |
| | 68,483,357 | 95,684,408 |

Stocks of grain in elevators:

| | This week. | Last week. | Same week last year. |
|---|---|---|---|
| Wheat | 1,092,000 | 2,144,000 | 3,532,000 |
| Corn | 5,475,000 | 5,534,000 | 6,738,000 |
| Oats | 642,000 | 736,000 | 2,928,000 |
| Rye | 482,000 | 454,000 | 292,000 |
| | 8,591,000 | 8,868,000 | 13,490,000 |

The Newport News ship yard is busier than it has been in years, having contracts in hand aggregating $25,000,000 and employing in the neighborhood of 7,000 men, the largest force ever used. Under construction are the United States battleships Virginia, Louisiana and Missouri, armored cruisers West Virginia and Maryland, protected cruiser Charleston, together with four large ferry steamers for the Hoboken Ferryboat Co. of New York, and five submarine torpedo boats for the Lake company.

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## AROUND THE GREAT LAKES.

Examinations will be held for the position as assistant engineer in the United States navy on Aug. 1 at Duluth, Minneapolis and St. Paul.

The United States naval training ship Essex now on her way from the ocean to the great lakes is at present at Montreal having her engines overhauled.

H. J. Pauly of Milwaukee has decided to cut down his steamer Walter Vail into a lumber barge. The barge will be the largest on the lakes with a capacity of 1,200,000 ft. of lumber.

The turbine steamship Turbinia is now in commission between Hamilton and Toronto, leaving Hamilton at 7 a. m., 12 (noon) and 4:30 p. m., and leaving Toronto at 10:45 a. m., 2:15 p. m. and 7 p. m.

Capt. C. A. Abbey of New York, superintendent of construction of the United States life saving service, visited Lorain this week to look over the site selected for the new life saving station at that port.

The steamer George C. Markham loaded with lumber and tied up at the Marine City Steamer Co.'s dock was struck by the steel steamer George L. Craig last week and sunk. The Craig was not damaged.

The receiver appointed for the steamer Portage, owned by the Interlake Transportation Co., has been discharged as the receivership would prevent the payment of money due for repairs recently made on the boat.

The King Iron Works of Ohio street, Buffalo, will repair the damage done to the propeller W. L. Brown of the Federal Steamship Co., by the blowing out of the cylinder head on her high-pressure cylinder on July 25.

While crossing Lake Michigan from South Haven this week the steamer Mary broke her shaft and drifted helplessly in the lake for several hours until sighted by the tug Perfection and towed into port. The passengers were calm.

Prof. H. F. Cox of the weather bureau, will have a new cable laid between South Manitou and North Manitou islands within two weeks. This will be of service to vessel owners as it is an important point for reports on vessels in shelter.

The propeller Portage, now undergoing repairs at the Craig dry dock, will be sold in a few weeks. The vessel was the property of the Interlake Transportation Co., and is now in a receiver's hands, the official being David B. Carpenter of Cleveland.

The damage done in the collision which occurred between the steel propeller Manola of the Minnesota Steamship Co. and the wooden propeller Iroquois, of the Pittsburg Steamship Co. in the St. Clair river on July 21, will involve considerable repairs.

The Canadian government, through its minister of railways and canals, has authorized the preparation of plans for a grain elevator of 2,000,000 bu. capacity to be erected at Port Colborne. The elevator is to be ready for business by the fall of next year.

Masters of vessels have been requested by government authorities to avoid the north entrance to the Sand Beach harbor, Lake Huron, until further notice, because of harbor improvements which are under way. Lights on the end of the breakwaters have been discontinued temporarily.

Vessel masters are requested by the Chicago yacht club to look out for the yachts in the cruising race from Chicago to Mackinac Island, which begins on Aug. 3 and to wire to the yacht club, at the club's expense, the location of the yachts as seen. About a score of yachts have entered this race, which will probably be one of the most interesting ever held on the great lakes.

The steamer D. M. Clemson loaded at the Toledo & Ohio Central Railway docks with 8,441 tons 1,700 lbs. bituminous coal breaking all Toledo records and giving her third place in lake coal record. These figures are the actual figures, those appearing in the daily newspapers having been estimates.

John F. Claney & Co., owners of a large coal dock at Racine, Wis., have asked for an injunction restraining union men from attacking their non-union employes, who operate the large clam-shell unloading device, owned by them. The union men wanted $1 per hour, but the company was only willing to pay 60 cents.

The Wheeling & Lake Erie railroad evidently anticipates an increase in the ore receipts at Huron. Electricians have completed wiring the dock for night work. A night yard engine and weighmaster have been put on and three clam shells and three derricks will have double shifts. This will insure prompt dispatch at night.

The Detroit & Buffalo line has proved the wisdom of its founders. The freight business this year shows an increase of 60 per cent and the passenger business an increase of 40 per cent over that of last year. The Eastern States and Western States are the two finest side-wheelers on the lakes and make the trip between the two cities very quickly.

Work on the north pier of Milwaukee harbor was finished July 10. This new pier is a solid mass of stone and concrete extending 2,000 ft. into Lake Michigan. Work has been commenced on the south pier, which is of the same character but only half as long. This will not be completed until next summer. The total cost of these two piers will be in the neighborhood of $750,000.

The steamer Post Boy, from Holland, while entering the harbor of Saugatuck, Mich., on July 23, struck a snag and sank five minutes after the captain had landed the passengers about 3 miles from the point of striking. The accident was caused by a displaced section of government pier which was carried over into the channel. Three boats have recently been punctured on the same obstruction, this season.

There was no intention on the part of the executive committee of the Lake Carriers' Association at its meeting in Cleveland last week to reduce the wages paid to mates. The mates are being paid the same wages that they received last year. In point of fact vessel owners represent that they are quite willing to pay the highest wage that they can possibly afford to pay. They prefer to pay well for good service.

Capt. Charles L. Potter, government engineer at Duluth, recommends appropriations of $020,000 for work in Duluth harbor the coming year. He favors the purchase of a dredge to keep the channel open. The amounts asked for improvements for other ports in the district are: Grand Marais, Minn., $2,000; Agate Bay, $5,000; Keewenaw Point, waterway, $45,000; Marquette, $5,000; Grand Marais, Mich., harbor of refuge, $40,000; Ashland, $350,000; Ontonagon, $10,000.

An important aggregate of marine insurance facilities, interesting to the general mercantile and shipping community, is presented in the announcement that Mr. F. Herrmann, of New York, has acquired the United States management of the Union Marine Insurance Co. Ltd. of Liverpool, England, The Firemen's Fund Insurance Co. of San Francisco, and that of the Columbia Insurance Co. of New Jersey. Mr. Herrmann also continues his present position as United States manager of the Mannheim Insurance Co. of Mannheim, Germany.

The steamers of the Algoma Central Steamship Co., which is one of the subsidiary enterprises of the Lake Superior Co. at the Sault, have gone into commission, which is fair evidence of reviving activity in the consolidated enterprises. The six freighters and three passenger boats owned by the company have been idle since early last fall. The vessels of the fleet are the freight steamers Paliki, Monkshaven, Theano and Leafield and the schooners Agawa and John J. Barlum and the passenger steamers King Edward, Ossifrage and the Minnie M.

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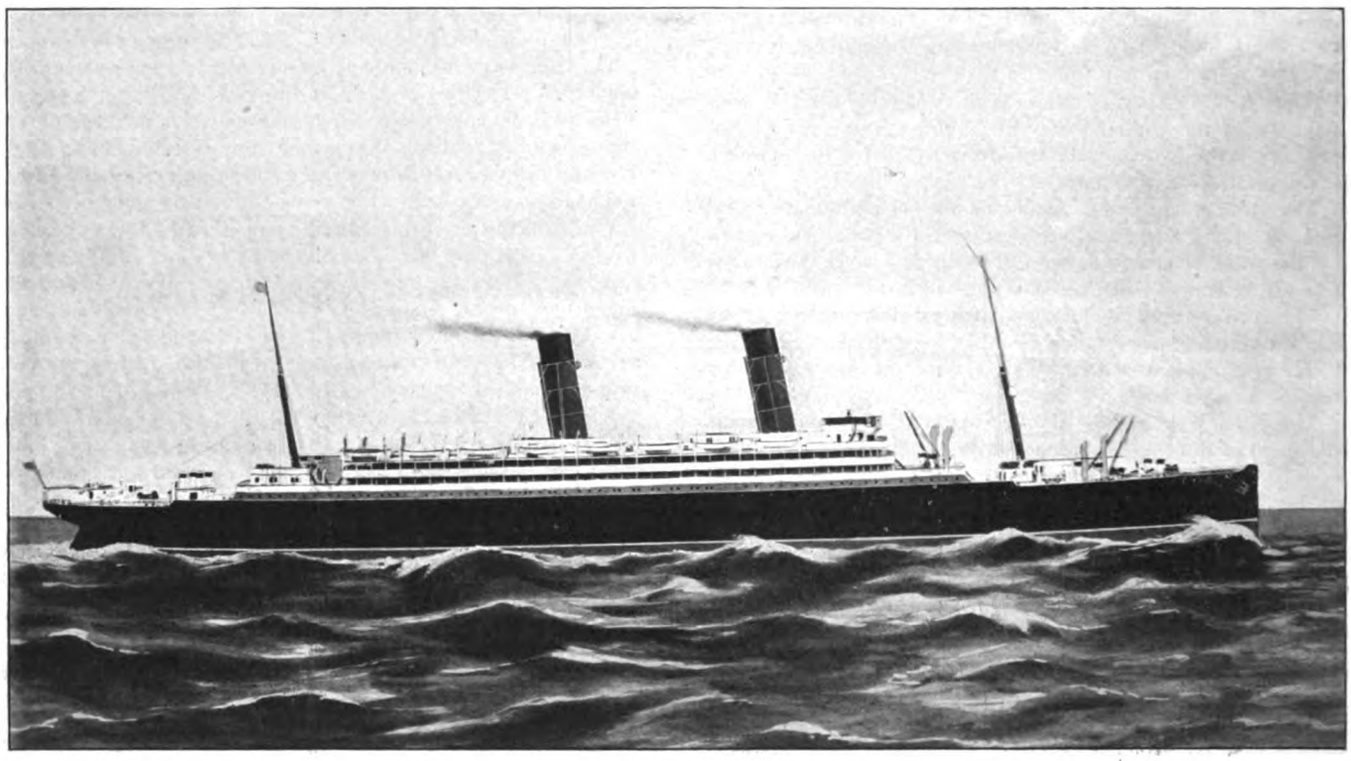
## LAUNCH OF CUNARD LINER CARONIA.

Liverpool, July 18.—The launch has taken place this week of the Cunard Line steamer Caronia, one of two 21,000-ton boats intended for the company's intermediate service between Liverpool and New York. She is being built by Messrs. John Brown & Co., Ltd., Clydebank, as is also her sister ship the Carmania, the former being fitted with reciprocating engines, while the latter is to be propelled by turbines. In the building of these two vessels of huge tonnage, and also the two additional express turbine steamers of 24,500 tons each, the Cunard company are showing an enterprise which has been quickened by foreign competition, and it is evident that they are determined to allow no competitor for Atlantic laurels to lead the way. The sailing of the Caronia in February next will be a significant foreshadowing of the further advanced turbine sister ship Carmania, and of the express liners which are to far excel any previous flights of naval architectural skill and shipowning enterprise. Mrs. Choate, wife of the United States ambassador in London, performed the christening ceremony. Lord Inverclyde, chairman of the Cunard company, at the lunch which followed the launch, said the Caronia would not be a record bearer, but she would hold the proud record in the Atlantic service as being the first ship in Great Britain which had been christened by the wife of an American ambassador. Her presence there, accompanied by the American ambassador, was a sign of the good feeling and good fellowship which existed between the two countries. He ventured to say, speaking for the Cunard company, that while no doubt America could very well do without the Cunard company, the Cunard company could not do without America. Referring to the controversy which had gone on in connection with the trade of the Atlantic, he said the directors of the Cunard company were fully alive to the responsibilities which they had to face, and he might also say that they were quite determined to carry through their policy, because they believed in doing so they were maintaining the credit of the company. Their object and aim was to keep the Cunard flag flying. Mr. Choate in responding on behalf of his wife, said he hoped the Caronia would be the means of promoting that communication between England and America which was the greatest blessing to both, and he trusted that the Union Jack and the Stars and Stripes would always float side by side as emblems of peace, unity and friendship. The leading dimensions of the Caronia are: length over all, 676 ft.; breadth, 72 ft. 6 in.; depth to shelter deck, 52 ft.; depth to boat deck, 80 ft.; gross tonnage, 21,000 tons; displacement, 30,000 tons; and launching weight, 13,800 tons. The hull of the Caronia is strongly built, the standard of strength and material being in excess of the requirements of the classification societies and the Board of Trade. The keel plate was laid on Sept. 21, 1903, so that in nine and one-half months the vessel has reached the launching stage, and it is expected that as she is well advanced, she will be completed by the close of the present year. Her launching weight is 13,800 tons, so that she is probably the heaviest vessel launched from any slipway. The plating ranges from ¾ in. to 1⅛ in. in thickness, and from 5 to 5½ ft. in breadth, the length being 32 ft. and the average weight 3 tons. In all 1,800,000 steel rivets have been used in the construction of the Caronia's hull, and some of those used in the bottom of the ship are 7 inches in length, and weigh 3½ lbs. She has a cellular double bottom, which is carried well up the sides of the ship above the bilges, thus enabling her to carry 3,500 tons of water ballast, and to compensate for any loss of weight due to consumption of coal, stores, etc., during the voyage. In designing and building the ship, steadiness and strength have been aimed at, and the special arrangement of the double bottom will conduce to this object. Bilge keels have been fitted for 250 feet of the ship's length, and should any accident result in the tearing away of these, the special double bottom would prevent damage to cargo or material interference with the ship. The Caronia has eight continuous decks, the uppermost being the boat deck, the others being named as follows: Promenade, bridge, shelter, upper, main, lower, and orlop. Bulkheads divide the ship into 13 watertight compartments as a further guarantee of strength and



CUNARD LINER CARONIA.

*[From a drawing supplied by the Cunard Steamship Co.*

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safety. The Caronia has been built in accordance with the requirements of the British admiralty for an armed cruiser. She will be fitted for mounting 12 quick-firing guns. The rudder weighs 25 tons, and can be operated at will by two distinct sets of steering gear, one for ordinary navigation and the other below the water line to comply with admiralty specifications. Should any accident occur to one set of steering gear the other, of course, would be available. Passengers are carried on six decks, i. e., boat, promenade, bridge, shelter, upper, and main decks, while some of the thirds are accommodated on the lower deck.

The Caronia's full complement of passengers of all classes will be 2,650, making with a crew of 450, the total number of persons on board 3,100. The first-class accommodation is of the most luxurious kind, the equipment including parlor rooms en suite, comprising bedrooms, parlor, bathroom, etc., and it is optional for those who occupy them to take their meals in the grand saloon or dine en famille. The second class accommodation will also be a feature of the ship, while the high water mark of privacy and comfort are extended to the steerage travelers, who are mainly quartered in four-berthed rooms.

The latest addition to the Jamaican fleet of Messrs. Elder Dempster & Co., the Port Kingston, has this week also run her trials on the Clyde, when she attained exceptionally good results, a speed of 19 knots being attained. This is considerably greater than either the builders or the owners expected. The Port Kingston is notable as the largest and finest vessel that has yet been built for the fruit trade between Britain and the West Indies. She is of 7,200 tons gross, has accommodation for 160 first and 60 second class passengers, and the holds insulated for the carriage of fruit are over 100,000 cu. ft. capacity. She will take the August sailing to Jamaica. It will be remembered that at the launch in April, Sir Alfred Jones presented the Duke of Marlborough with a fine model in silver of the Port Kingston.

Some interesting particulars relative to the amount paid to British shipowners for the transport of troops, stores, etc., during the South African war are included in an admiralty return that has just been issued. The total amount paid was £75,314,695.

The American liner New York which has been for three months in the hands of Messrs. Harland & Wolff, Belfast, undergoing extensive repairs, consequent upon her collision with the British government transport Assaye in the Solent, has completed her repairs, and returns immediately to her place in the Southampton-New York service of the American Line.

The new liner America which is being built by Messrs. Harland & Wolff, Belfast, for the Hamburg-American Line will have a tonnage of 23,500 tons gross register. She will have accommodation for 570 first, 300 second, 280 third class passengers, as well as for 2,300 passengers in the 'tween decks. She will be ready next year, and will trade between Hamburg and New York. Her sister ship, the Europa, is being built by the Vulcan Company, Stettin, and will be ready in 1900. Both vessels will have a speed of 17 knots.

After a long interval in sailings, owing to the depressed condition of trade, the Gulf Transport Co. (Messrs. J. H. Welford & Co.) announce the departure of the Irada from Liverpool on the 28th inst. In view of the improved crop reports from the cotton districts of the Southern States, it is expected that shipments will be early and develop into some degree of activity this season.

The following particulars will show to what extent American and Canadian meat imports have grown as far as Liverpool is concerned. Eleven steamers have arrived in Liverpool during the past week from the various American and Canadian ports, with cattle, sheep, sheep carcasses and fresh beef. The vessels were as follows: The Dorset, with 20,187 sheep carcasses; Etruria, with 1,124 quarters of beef, the Severns, with 50,616 sheep carcasses and 4,500 quarters of beef; the Arabic, with 1,458 quarters of beef; the Salocia, with 623 cattle and 340 sheep; the Oceanic, with 4,423 quarters of beef; the Michigan, 721 cattle, 645 sheep and 2,874 quarters of beef; the Merion, with 829 cattle; the Ottoman, with 731 cattle and 1,039 sheep; the Sylvania, with 840 cattle and 716 quarters of beef; the Bovic, with 740 cattle, 1,040 sheep and 3,200 quarters of beef, and the Cestrian with 700 cattle and about 4,000 quarters of beef, making a total of 5,200 cattle, 3,034 sheep, 70,803 sheep carcasses, and 22,304 quarters of beef. Compared with the arrivals of the preceding week, these figures show an increase of 350 cattle, 1,128 sheep, and 22,356 sheep carcasses; and a decrease of 7,762 quarters of beef.

The Cunard Line steamer Lucania has now been fitted like her sister ship, the Campania, with the more powerful installation of wireless telegraphy apparatus, capable of receiving messages transmitted over a distance of 2,000 miles. Like the Campania, also, the Lucania will henceforth publish a daily newspaper on board the steamer during her voyages to and from the United States, commencing with the ship's departure from Liverpool today for New York.

## HAULING A VESSEL ON THE WAYS.

A feat, rare in ship building, was successfully accomplished at the yard of the Harlan & Hollingsworth Co., Wilmington, Del., last week. The steamer General Meigs was hauled from the river to a position high and dry on the ways without an accident either to the vessel or to the workmen. It is not a difficult matter to launch a vessel from the ways, but it is a considerable test to get a fully equipped vessel of any size on to the ways again without mishap.

The dry dock of the Harlan & Hollingsworth Co. is occupied at present, and the owners of the General Meigs desired repairs made as soon as possible, so their craft could get into service again. As it was impossible to float the Meigs into the dry dock at this time, President David C. Reid and Gen. Supt. John Lockhart decided that the only alternative was to try to haul the Meigs out on the ways and there make the repairs. The vessel is 132 ft. long, 26 ft. wide and has twin screws.

Cradles were built into which the steamer had to be floated at high tide, and two powerful steam winches were rigged with massive hawsers connecting with the hull of the Meigs. At high tide Gen. Supt. John Lockhart, Foreman of Carpenters William Harmon and Foreman of Riggers Joseph Smith, with a force of workmen, began the perilous and novel undertaking. The Meigs was floated to a point directly in line with the ways, and in such a position as to rest upon the keel blocks, upon which the cradles were constructed.

This was by no means a pleasant undertaking, for some of the workmen had to stand in the water in getting the hull carefully balanced and adjusted on the blocks. One workman was in the river for three hours with his clothing on, and several others were in for a shorter time. After much difficulty everything was gotten in readiness, and the steam winches were put in operation. The 6-in. hawsers, and snubbing line became taut and inch by inch the Meigs was dragged from the river and up the incline. It was a ticklish and dangerous job. At any moment the Meigs was likely to topple over and timbers were in danger of giving way under the great strain. The winches continued to groan under the tension and the big mass of iron and steel represented in the vessel began to climb up the ways. At last the entire hull was out of the water, and the workmen felt like cheering as they saw their labors were successful. The remarkable task is but one of the many now being accomplished in the Harlan & Hollingsworth yards. It reflects great credit upon Superintendent Lockhart, and Foremen Harmon and Smith and the skilled workmen who assisted them.

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# Labor's Appeal for Aid to Shipping.

During the sessions of the Merchant Marine Commission in Cleveland Mr. A. Van Druven as the representative of the Brotherhood of Boiler Makers and Iron Ship Builders of America delivered a powerful appeal on behalf of labor for aid to American shipping. His testimony was to the effect that thousands upon thousands of members of his organization were idle because of stagnation in the ship building industry. He said:

"We stand before you as representatives of American labor and we ask for the passage of a bill through congress that will cause the building in American ship yards of the vessels required for our oversea trade. Congress has for nearly half a century encouraged and maintained foreign shipping in our foreign trade through its refusal to protect American ships in that trade. Hundreds of millions of dollars of American money have been exported to pay aliens to build the millions upon millions of tons of foreign ships that have been and are now employed in doing the bulk of our oversea carrying. We ask you to reverse the policy and protect American ship owners, American ship builders and those whom they employ, to the same extent that, by your inaction and neglect, you have so long protected foreign ship owners, foreign ship builders and the aliens whom they employ.

"We represent the Brotherhood of Boiler Makers and Iron Ship builders, an organization affiliated with the American Federation of Labor. We have a membership of 40,000 American workingmen, with over 500 local lodges in as many different parts of the United States. About one-half of the members of our brotherhood are seeking employment at their trade, the depression in which is due to the fact that the ships employed in doing our foreign carrying are built in foreign countries by foreign labor. And we are but one of a number of labor organizations whose members are largely if not wholly dependent upon American ship building for work at their trades. The wages that we receive, when we have work, are the wages that are paid to skilled mechanics employed in similar industries in the United States, and they are no more than are necessary to enable us to live as becomes American citizens. We will submit to no reduction in the wages we receive in order to have ships built in the United States, and least of all will we accept the wages that are paid in foreign shipyards, which do not exceed one-half of the wages that we are paid.

"The remedy for the decline in American shipping must be one that shall leave unimpaired the rates of wages paid in American ship yards—that may as well be understood in the beginning. We know that there are many American workingmen who are steadily employed at their trades and receiving the American scale of wages because the product of their labor is protected by acts of congress against the free competition of the product of foreign labor. We are convinced that, were it not for the protection which congress has seen fit to give to the product of American workingmen, fully one-half of those who are now steadily employed would be, like we are, seeking work at their trade. We ask no more than you accord to other workingmen in the matter of protection, and we assure you that we shall accept no less. The product of American ship yards must be protected against the competition of the product of foreign ship yards, precisely as the product of American labor in other industries is protected against foreign competition.

"It will not do to say that foreign ships may not obtain American registers, and assert that this is prohibitive protection in favor of American-built ships, so long as foreign-built ships are permitted to enter our ports and engage in our deep-sea carrying upon terms of absolute free trade competition with American-built ships. There is no protection for American ship builders when the product of their labor is compelled to meet the product of foreign ship builders upon terms of free trade competition. No man will invest in an American-built ship, costing from 25 to 40 per cent. more to build than a foreign ship costs, and then attempt to run her in free trade competition with foreign ships. More than a full generation of trial has shown that such competition is a continuous failure. When it is shown, as it can be, and as it doubtless has been to the entire satisfaction of every member of this commission, that the cost of operating an American ship is much greater than the cost of operating a competing foreign ship, it must be still more plain to you that there is nothing to attract capital into American-built ships for the foreign trade. But, when to these two items of construction and operation expense, is added the further handicap of government aid extended by foreign governments to the foreign ships that compete with our own, is it necessary for you to inquire why it is that we have but one ton of American shipping in the foreign trade today under the American flag, where we had three tons 43 years ago?

"It has been the policy of the United States during practically the entire lifetime of every mechanic actively employed in the United States today to protect him against the competition of foreign labor in foreign countries—every mechanic alone save those employed in ship building for the foreign trade. You cannot expect American workingmen who are employed in the building of ships to accept a rate of wages only one-half that which they now receive—only one-half that received by their fellow workingmen in other trades, even if such wages are the total received by the workingmen employed in foreign shipyards.

"Congress, by its protective policy, has created and maintains a condition in the United States which must be uniform to be just. So long as it says to me, and to the men of my craft, that we cannot enjoy the same measure of protection that our brothers who are employed in other industries enjoy, just so long congress will continue to investigate the decline of American shipping and seek remedies for its revival. The only remedy is equality of condition for the product of our hands with that produced by the hands of workingmen in the protected industries.

"For nearly a century congress has excluded foreign-built vessels from our coastwise trade, and, in order for those seeking to engage in that trade to get the vessels they need, they must apply to American ship yards. When they get there they must pay the American scale of wages, rates on a par with those paid to other workingmen in other protected trades. In that branch of the industry you long ago created and have ever since maintained a protective condition. Now, gentlemen, do you think that you can induce American workingmen to go into American ship yards and build ships for the foreign trade at one-half the wages that are paid to the men who are building ships for the protected coastwise trade? Certainly not. It must be clear to you that you have created and long maintained a condition of partial protection to which you have been striving for over forty years to adjust a condition of free trade, and of course it don't work. You can't expect it to work. You have got to make the protective policy uniform in our ship yards—the product of our hands must be protected just the same when it is to engage in the foreign trade as it is when it is to engage in the coastwise trade—either that, or else free trade all along the line. But I am sure that none of you expect to find a remedy for our shipping decline through free trade channels.

"Look around you in this great lake country and see the

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splendid ship yards and the magnificent shipping, all the product of and giving employment to American workingmen, and remember that it is due to the exclusion of foreign vessels from participation in our trade. It has been reserved for our own people, and it has grown great and prospered as a consequence. Here we build ships for just one trade—a protected trade—and the men employed in the shops and yards receive the full standard of American wages. They will accept nothing less. Do you think that other American workingmen, employed in other American ship yards, even in the building of ships for the foreign trade, will accept less wages than we receive? Of course you do not. Protection is universal in our trade up here, and it sets the standard for the whole country. So, you must see, congress has created a condition of protection in ship building that governs the whole industry. It is prosperous where it is protected, it is a failure where it is unprotected.

"Today I may be employed at American wages in the building of a vessel for the coastwise trade. Do you think that tomorrow I will accept the foreign rate of wages because my employer puts me on a ship building for the foreign trade that will be compelled to compete under free trade conditions with foreign ships? Certainly not. Do you think in one ship yard on one set of ways there will be a gang employed in building a ship for the coastwise trade at the American rate of wages and on another set of ways another gang will be employed in building a ship for the foreign trade at the foreign rate of wages? Of course you do not. Do you think that in a boiler shop one set of men will work for foreign wages in building a boiler to be put into a ship for the foreign trade, and right next to them another set of men will receive American wages for building a boiler to be put into a ship for the coastwise trade? The condition you have created in our coastwise trade conforms to the general conditions that obtain in all of our land industries—a protective condition—and it is impossible to expect that you can establish a successful branch of the same industry under free trade conditions. The result of such efforts has been to exclude from our ship yards the building of ships for our foreign trade.

"Rather than extend the protective principle uniformly to our ship building and ship owning interests, congress has evaded its plain duty, and the men of my craft who are seeking work at their trade are the sufferers for it.

"What is there about our coastwise and domestic trade that entitles congress extending and maintaining the protective system that it has so long maintained, and at the same time justifies the denial of protection to our ships engaged in the foreign trade? How can you look upon our prosperous protected coastwise and domestic shipping, and watch its growth, and not realize why it is that our shipping in the foreign trade which is subject to free trade foreign competition has shrunk and declined? If you look for a prosperous American shipping upon the seas in free trade and unprotected competition with foreign shipping, under the protective conditions you have created in our coastwise trade and our land industries, you are looking for the impossible.

"Face to face with these facts, as you must have been during the course of your investigations, perhaps some of you are considering why you may not import foreign ships and place them under American registry. You may think that you can, in this method, at least overcome the higher first cost of building ships in American ship yards. But, as you reflect on that line of policy its impracticability must be manifest. It must be clear that you cannot, by increasing the free trade conditions of competition, establish, in a protective country, a prosperous industry. It will be no more possible, by free ships, to establish an American shipping in the foreign trade than it would be to make oil and water mix. Even if you had free ships you would still be confronted with the obstacle of the cost of operation under the American flag. To overcome this would you advocate allowing aliens to command and officer the ships? Would you diminish the quantity and consent to an impairment of the quality of the food served on board American ships—would you conform the food scale to that of the most poorly fed of all the ships with which our own compete? And yet, can you contemplate with favor, the idea of protecting American officers and seamen on board American ships, and at the same time deny protection to our workingmen in the ship yards. Are the men who officer and man our ships any more deserving of protection than those who build them?

"Look at this problem as you may, gentlemen, it must be clear to you that there is but one course for you to pursue: you must devise a method of protection that shall be practical and effective which will overcome the adverse conditions under which ships are built in the United States and operated under the American flag, in competition with foreign ships. Until you completely abandon the protective policy there is no other way by which you can have an American merchant marine in the foreign trade than by protection. You have free trade competition betwen American and foreign ships now in the foreign trade and that competition has been destructive of American shipping. Protection, therefore, is the only remedy applicable to existing conditions in the United States in the shipping industry.

"Finally, it must be clear to you all that American labor is more deeply concerned in the successful conclusion of your investigations than any other class of citizens. Capital can find innumerable ways for safe and profitable investment, and you need not concern yourself with its needs. When you are told that those who are seeking protection for our shipping in the foreign trade are seeking to still further enrich those who are already wealthy—that the demand for protection comes from capitalists and corporations—remember that the statement is untrue, that so long as you deny protection to American shipping in the foreign trade, so long you deny employment in American ship yards for American labor. If you fail—if you do not apply a remedy that will be successful—remember that your failure will continue and perpetuate the protection the aliens who now control the building and operation of the shipping in our foreign trade have so long enjoyed. The issue is distinctively and only one between foreign and American labor."

## OBITUARY.

Capt. O. A. Maxwell of Ashtabula, aged sixty-three years, is dead. He had sailed the lakes for thirty-three years, and was master of a vessel when only twenty-one years of age. He retired from the lakes some years ago.

Capt. Frederick Sharpe, one of the oldest and best known marine wreckers in the world, died in the United States Marine Hospital at Clifton, S. I. He was overcome by gases in the hold of the sunken Boston City in the lower bay on July 19. During his service, Capt. Sharpe had worked on most wrecks of any importance occurring on the Atlantic coast.

Rear Admiral Henry C. Taylor, chief of the bureau of navigation, died this week at Copper Cliff, Ont., while on a visit to his son, Roger Taylor, superintendent of the Canadian Copper Co.'s works at Copper Cliff. Admiral Taylor commanded the Indiana at the battle of Santiago. He was appointed to the naval academy from Ohio in 1860. In 1893 he was made president of the naval war college at Newport and attained the rank of rear admiral in 1901.

The American Line steamship St. Louis left New York last week without passengers for Southampton. After delivering the mail she will go to Belfast to have her engines repaired.

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## SCOTCH SHIPPING LETTER.

Glasgow, July 14, 1904.—Our annual industrial holiday associated with Glasgow Fair begins this week. Work in the larger ship yards and engine shops in the district above and including Renfrew and Clydebank are suspended on Thursday night. At Clydebank John Brown & Co. will retain during the holidays a considerable number of carpenters, who will be engaged setting the frames of the Carmania, the second of the sister Cunarders. No other yard in the district is so busy as the Clydebank, and in no other case will the holiday arrangements be different from those of previous years. In several yards there is so little work on hand that an extension of the holiday is much more likely than work at overtime rates during the fair. The holiday nominally terminates on Monday week, but it will be prolonged for a few days, and in the present dullness of trade in so many of the yards this will be less of a grievance to the employers than formerly. The inclination on the part of masters and workers is rather to lengthen the holiday till the end of the month. At any rate, there is likely to be little said about broken time if the men fail to return promptly to work when the yards are reopened. In most of the establishments small squads will be retained over the holidays, overhauling plant and machinery.

Some very interesting evidence has been given by Mr. John Denholm, shipowner, Greenock, before the select committee of the House of Commons appointed to consider how far British regulations might be extended to foreign vessels trading to and from British ports. Mr. Denholm's evidence related chiefly to the transfer of British ships to foreign flags, and he appeared on behalf of the Clyde Steamship Owners' Association, which represents 400 steamers with a gross tonnage of 800,000 tons. His own firm manages the Park Line, which is engaged largely in Continental and Baltic trades. Mr. Denholm said that British shipowners are at a disadvantage as compared with foreign owners. Proceeding to cases of transfers he mentioned first the steamer Gunther, which had been on time-charter by his own firm. The owners guaranteed her to carry 1,850 tons under Board of Trade restrictions, and 2,050 tons outside those restrictions. Those figures were exceeded on several voyages. She was running on the Baltic and Continental trades and would make about seventeen round trips in the year. An average rate of 6s from a Continental port meant an advantage of £1,020. The loading and discharging might be 1s 6d per ton, which left a net profit of 4s 6d. After making necessary allowances the profit amounted to about £800. The ship was valued at about £15,000 or £16,000, so that the net profit would be 4 or 5 per cent. Another case was a steamer, the Dalbeattie, which was owned by an English firm. She carried 1,880 tons, all told, under Board of Trade regulations as fixed on her line. Since being transferred to the Norwegian flag, 1,964 tons were carried from Bilboa to the Clyde on one voyage, and last month she was loaded in Glasgow with a cargo of 1,940 tons. He had not made the calculation in the case of the Dalbeattie, but the result would be very much the same as in the case of the Gunther. The Board of Trade officials can stop foreign ships, but as a matter of fact they do not carry that out in practice. Their attention is not called to the loading because the line is not on the side of the ship. He proceeded to give other cases of ships which had been transferred, the capacity of which before and after transfer was represented by the following figures: 2,050 tons and 2,200 tons; 1,654 and 1,775; 1,350 and 1,450; 800 and 950; 780 and 850; 1,450 and 1,000; 600 and 725; and 2,550 and 2,750. It was common knowledge that foreign ships loaded more cargo to and from the United Kingdom ports than British ship-owners could possibly do. The Board of Trade are not able to check them so effectually as they do British ships. The regulations ought to be applied to them all. The timber-carrying regulations had been applied to foreign and British ships, and those had worked satisfactorily. If foreign ships traded with our ports they should comply with our regulations as British ships had to do in foreign ports. There could not be any hardship in such measures being taken. They could easily check an incoming cargo of coal, for instance, as the number of tons per day consumed by the vessel was easily got at. Foreign ships trading with our ports should have the British load-line. He does not think it would be resented by foreign powers, because they compel us to comply with all their regulations. Those foreign vessels, he remarked, were chartered by British agents. It was to the interest of a British agent to charter a foreign ship, because he could get a capacity from a foreign bottom which could not be got from a British ship. He said that under present circumstances they were really providing a bounty for foreign ships. The first ship he had named was chartered by himself for two years, and what he had described was a common practice. This showed that British shipowners were thrown out of employment under the present system, and the regulations were the cause of serious loss to British trade

Barclay, Curle & Co., Ltd., have launched yesterday a new steel vessel, S. Monica, built for the Red Cross Iquitos Steamship Co., Liverpool, for service on the River Amazon. This vessel, which is of a new type, has been specially built for carriage of a large amount of cargo and about eighty passengers. The vessel is 150 ft. in length, 28 ft. 6 in. in breadth, 14 ft. 6 in. in depth, and of 464 tons gross. She is exceptionally well equipped for the trade, having two winches, powerful windlass, and steering gear, two masts fitted with strong derricks, and teak decks, while the sanitary arrangements are particularly complete.

There is considerable interest for Americans in the new harbors which have been opened this week at Dover and Folkestone, because of the fresh starting place they provide for the transatlantic voyage. The Hamburg-American Line has already begun to use Dover for the embarkation of passengers from Great Britain for New York. There are two new harbors there, the admiralty and the commercial harbor. The latter is what will interest you most. The commercial harbor occupies the western corner of the area enclosed by the breakwaters and occupies sixty-eight acres. The admiralty pier, which was completed in 1871, was arranged for the use of Continental steamers and has a large railway station upon it. It has now been extended seaward for a length of 2,000 ft., so as to form with the eastern and southern breakwaters to the large admiralty harbor. For the use of Atlantic liners a new pier, known as the Prince of Wales pier, with a length of 2,850 ft., has been completed. The outer part of this—1,650 ft. of its length—is of concrete mansonry of the same massive construction as the breakwater, while the inner part of 1,200 ft. is an iron structure serving as a passengers' approach to Atlantic liner berths. The trains for conveying the passengers from these berths are to pass over a special viaduct, 800 ft. long, on to the main line of railway. The width of the Atlantic liner pier is 35 ft., and the height above high water 10 ft. At certain parts of the pier landing stages have been formed at elevations to suit work at low water. For improving the facilities provided in connection with the Continental traffic, it is intended to construct a new pier 1,100 ft. in length and 280 ft. in width, on a site within the commercial harbor and protected by the admiralty pier. This pier will be sufficiently large to accommodate two outward-bound boats on one side, and two inward-bound boats on the other. The whole of the pier is to be covered by a railway station with three platforms, where four trains may lie at the same time. The principal difficulty is to arrange a time of departure from Hamburg or Bremerhaven to bring the ship into Dover at a convenient hour to suit London passengers. The time to Southampton is practically twenty-four hours, and boats leaving the German port in the forenoon can leave Southampton on the following forenoon.

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Dover is so much nearer to the German ports as to make the hour of departure either late in the evening or early in the morning, and to wait the arrival of a train leaving London at a suitable hour may involve delay in the passage.

The ubiquitous Prince Line has decided to run a line of steamers to South African ports from British ports. The first steamer is the Tudor Prince, which is now loading at Birkenhead for Cape Town and Natal. At first the boats will go to New York to complete loading, but as soon as sufficient cargo offers they will go to South Africa direct. When Prince Line boats are not available the company will send cargo by other vessels to New York, where it will be transhipped to one of the Prince Line vessels.

Recent heavy insurances on British warships under construction have caused considerable activity in the marine insurance market. Two insurances of £259,000 each have been placed on the government scouts, Pathfinder and Patrol. These vessels, which are being built at the works on the Mersey of Cammell, Laird & Co., Ltd., are insured under government contract conditions, and under the tariff, for one year, or until the scouts are delivered to the admiralty after completion. The present insurances come into force on the launching of the vessels, which is one of the chief risks covered under the policies. After the launching, trial preliminary trips are at the risk of the underwriters, on the condition that an adequate complement of officers and men be supplied by the admiralty for manning and navigating the warships for purposes of trials prior to their being handed over. This condition is subject to the reservation that, should it be deemed expedient to allow either of the vessels to make trial trips between the Mersey and the Clyde without a navigating party on board, the builders are still covered under the contract for a consideration to be paid to the underwriters over and above the present premium paid. Apart from the more important risks, that of fire is included, both on shipboard and in connection with such materials in the workshops as will ultimately form part of the vessels, the transporting of the same from dock to dock, and also the lifting and placing of the machinery on board the new scouts.

The British steamer Cheltenham, captured by the Russians, had on board a valuable cargo of railway material from Japan for Korea and was insured against war risks for £40,000. She was several days overdue at Fusan, and was placed on the overdue market at 20 guineas per cent against total loss from any cause. Later, 25 guineas per cent was paid for war risk only, it being anticipated that the steamer might be captured by the Vladivostok squadron. The Cheltenham is a twin-screw steamer of 3,741 gross tonnage, built at Sunderland in 1901 by W. Doxford & Sons. Her owners, Messrs. Galbraith, Pembroke & Co., have received a cablegram stating that the ship had been brought into Vladivostok to await trial at a prize court. Had the steamer been lost and posted as missing, leaving no clue as to the cause of the disaster, underwriters on the marine policies which exclude war risks would have been liable, even though the accident might have happened through contact with a drifting mine. While war risk underwriters are considerably concerned with the new development, those interested in the ordinary insurances on the vessel which amount in the aggregate to £35,000, are exempt from liability.

A return has been issued in connection with the trials of the new large destroyers of 25½-knot speed, which indicates under what severe pressure the speed is realized by these larger craft. They are on an average 230 tons heavier than the earlier vessels of 30-knot speed ranging up to 550 tons. Their construction was decided upon as a result of strictures made on the strength of the lighter boats by the naval court martial which sat in judgment on the loss of the Cobra. Events have proved that these criticisms by officers who were not versed in naval architecture, or in the problems of stresses of seagoing craft, were not justified, and the committee of experts appointed to make thorough and scientific investigations of the subject came to the definite conclusion that there was no reason for the alarmist attitude taken. Larger boats have their compensations, but without increasing the gun-power they cost 25 per cent more, and reduce materially the radius of action at any given speed. Events in the far East have shown that speed is everything in destroyer tactics so the reduction from 30 to 25½ knots is a serious matter, especially as the lower speed is difficult of realization. In the old days a ship was not expected to require more than 1 in. or 1¼ in. of forced draft in the closed stokehold, although in some extreme cases this has been considerably exceeded. With these destroyers, however, the pressure was under 2 in. in only three cases out of seventeen trials completed, while in the others it ranged up to 5.3 in., in two cases it was 4.4 in., and in the others it ranged between 2½ and 3 in. The Yarrow destroyers have done best in this respect. Two of them are turbine-driven and one, the Velox, steamed 27.1 knots for 7.35 tons of coal per hour, the other, the Eden, 26.2 knots for 7.45 tons per hour. The best result with reciprocating engines was 26.2 knots with a coal consumption of about 5½ tons per hour, this vessel having the remarkably low rate of 1.65 lb. per indicated horse power per hour. Another reciprocating engined vessel returned 1.56 lb. for 25.8 knots, which also gives a better result than the turbine vessels. A third, which steamed 26.1 knots only, consumed 1.91 lb. All these three vessels were Yarrow's. In the case of the other vessels the consumption ranged up to 2.79 lb., and the average result is not more than the 7½ tons recorded for the turbine vessels. Where the consumption was over 2½ lb. the vessel had to carry an increase in load at the rate of four tons for each tenth of a pound in excess of 2.5 lb. per I. H. P. per hour, while for less consumption a deduction was made for the saving on the same basis.

## WORK AT NEWPORT NEWS.

Norfolk, Va., July 20.—An interesting report in connection with Hampton Roads ship building interests is that the Petersburg Iron Works, which now operates a small plant at Petersburg, turning out dredges, barges and small craft for the government and private parties, will be removed to Norfolk and located on the Berkley side of the Elizabeth river. It is stated that Norfolk parties have succeeded in raising sufficient capital to secure control of the plant and will lose no time in making the transfer. It is said that when the improvements are made the value of the new plant will be about $1,000,000. The significance of the move is that the new works will doubtless be a factor in the building of smaller vessels and will be in position to secure considerable work of this kind that is now done at Baltimore.

The navy department seems to be determined to lead the Newport News Ship Building & Dry Dock Co. in the race between the battleships Louisiana and Connecticut. Several days ago interest in the ship building race between the government yard and the private yard was heightened by the announcement that the Connecticut, building at Brooklyn, and the Louisiana, building at Newport News, would be launched in September. Now comes the statement from official sources that the Connecticut will be launched at Brooklyn Sept. 29. The ship yard across Hampton Roads has made no announcement yet of the date for the launching of the sister ship of the Connecticut. The Louisiana leads the other vessel by 6 per cent. and considerable interest is manifested in the possibility of the private yard placing the date of its launching ahead of Sept. 29 in order to have its ship overboard first.

A corps of engineers are now working upon Zion City, Ill., and a harbor will soon be constructed at that place.

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## STEEL CORPORATION'S QUARTERLY STATEMENT.

The directors of the United States Steel Corporation held their quarterly meeting in New York this week and, as has been expected, declared the regular dividend of 1¼ per cent on the preferred stock. This dividend is payable Aug. 30. Books close on Aug. 6 and reopen Aug. 31. The earnings are much diminished over those of 1903. Thomas Morrison of Pittsburg, Andrew Carnegie's nephew, was elected a director to succeed Charles M. Schwab resigned.

Among the directors present at the meeting were J. P. Morgan, John D. Rockefeller, jr.; W. E. Corey, G. W. Perkins, James Gayley, John F. Dryden and E. C. Converse. G. W. Perkins presided. Beyond the business indicated and hearing the quarterly report read nothing of importance was done. President Corey of the corporation made a statement regarding his recent conference at Pittsburg with the presidents of subsidiary companies. Those who conferred in Pittsburg with President Corey were: A. C. Dinkey, president Carnegie Steel Co.; Thomas Lynch, president H. C. Frick Co.; W. C. Palmer, president American Steel & Wire Co.; A. B. Schiller, president National Tube Co.; John A. Topping, president American Sheet & Tin Plate Co.; J. H. Reed, president Bessemer & Lake Erie railroad. This was President Topping's first appearance in the group of President Corey's advisors. He succeeded W. T. Graham, president of the American Sheet & Tin Plate Co., and officially will take charge Aug. 21.

Mr. Corey found that the presidents of the subsidiary companies had reduced operating forces to a minimum to realize practically in the pay roll, the benefits of reduced consumption. The current demands, while better and calling for more output at many places, did not appear to the subsidiaries as substantial. They expect to see a further slackening in August, although they think the present quarter will be profitable. The report for the last quarter follows:

| | |
|---|---|
| *Net | $19,490,725 |
| Sinking funds on bonds of sub-companies | 469,425 |
| Balance | $19,021,300 |
| Depreciation and reserve funds | 3,059,062 |
| Balance | $15,962,238 |
| Interest and sinking funds on United States Steel Co. bonds | 6,879,675 |
| Balance | $ 9,082,563 |
| Preferred dividends | 6,304,919 |
| Surplus | $ 2,777,644 |

*After deducting ordinary expenditures for renewals, repairs, maintenances, interest, fixed charges, etc.

Net earnings by months for the first half of the year compare as follows:

| | 1904. | 1903. |
|---|---|---|
| January | $2,868,213 | $ 7,425,775 |
| February | 4,540,673 | 7,730,361 |
| March | 5,500,000 | 9,912,571 |
| April | 6,863,833 | 10,950,204 |
| May | 6,256,518 | 12,744,324 |
| June | 6,370,374 | 12,992,780 |

## PIG IRON PRODUCTION FOR SIX MONTHS.

The American Iron & Steel association has received from the manufacturers practically complete statistics of the production of all kinds of pig iron in the United States in the first half of 1904; also practically complete statistics of the stocks of pig iron which were on hand and for sale on June 30, 1904. The production of pig iron in the first half of 1904 was 8,173,438 gross tons against 8,301,885 tons in the last half of 1903 and 9,707,367 tons in the first half of 1903.

The production of Bessemer pig iron in the first half of 1904 was 4,530,046 gross tons against 4,500,283 tons in the last half of 1903 and 5,480,619 tons in the first half of 1903. The figures for the first half of 1904 include 87,582 tons of low-phosphorus pig iron, against 110,699 tons in the last half of 1903 and 89,723 tons in the first half of that year.

The production of basic pig iron in the first half of 1904 was 1,061,901 gross tons, against 836,923 tons in the last half of 1903, and 1,203,803 tons in the first half of 1903. Basic pig iron made with charcoal is not included.

The production of charcoal pig iron in the first half of 1904 was 213,356 gross tons, against 272,040 tons in the last half of 1903 and 232,717 tons in the first half of 1903.

The production of spiegeleisen and ferromanganese in the first half of 1904 was 114,205 gross tons, against 81,986 tons in the last half of 1903 and 110,675 tons in the first half of 1903. The production of ferromanganese alone in the first half of 1904 amounted to 26,541 tons, against 14,118 tons in the last half of 1903 and 21,843 tons in the first half of that year.

The production of bituminous coal and coke pig iron in the first six months of 1904 amounted to 7,337,279 gross tons, of anthracite and coke mixed to 607,624 tons, of anthracite alone to 15,170 tons, and of charcoal to 213,356 tons. Included in the bituminous figures is a small quantity of ferrosilicon made with electricity.

The stocks which were unsold in the hands of manufacturers or their agents or were under their control in warrant yards or elsewhere on June 30, 1904, amounted to 623,254 tons, against 501,438 tons on Dec. 31, 1903, 126,301 tons on June 30, 1903, and 49,951 tons on Dec. 31, 1902.

The whole number of furnaces in blast on June 30, 1904, was 216, against 182 on Dec. 31, 1903, 320 on June 30, 1903, 307 on Dec. 31, 1902 and 286 on June 30, 1902. The number of furnaces idle on June 30, 1904, was 209.

## PERSONAL.

Henry C. Frick of Pittsburg left last week on the Cedric to be gone for several months. While in Paris he will be in conference with Thomas Morrison, discussing the future of the United States Steel Corporation.

Congressman Theodore E. Burton, chairman of the committee on rivers and harbors, is in Chicago with members of the committee inspecting the Chicago river with especial reference to the tunnel obstructions. His visit is at the personal request of Chicago interests.

Lieut. Comd'r John L. Gow, until recently attached to the battleship Massachusetts, has been assigned as inspector of machinery and engineering supplies used in the construction of the battleships Rhode Island, New Jersey and Vermont, which are being built by the Fore River Ship & Engine Co., Quincy, Mass.

Mr. Louis Terven, E. E. (University of Wisconsin), has recently been appointed chief electrician of the Nernst Lamp Co., Pittsburg, Pa. Mr. Terven was for some time electrician of the United States navy yard, Port Royal, S. C., which position he resigned to enter the experimental laboratory of the Nernst Lamp Co. Later he was given charge of the chemical engineering department of this company.

Capt. W. W. Bates of Denver, formerly commissioner of navigation, is writing a series of letters upon request for the American Economist entitled "Letters on Marine Recovery." In them he will discuss the mode and manner of applying regulations of commerce, otherwise called discriminating duties, to the revival of our marine in the foreign trade. There will be about twenty letters in all. The measure, drawn by Capt. Bates, will be submitted to the Merchant Marine Commission for its consideration.

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## ITEMS OF GENERAL INTEREST.

Capt Barziliai Cousins, a sugar planter of Plaquemine, La., died recently, aged 66 years. He was for many years in command of vessels trading between Liverpool and Pacific Coast ports.

The steamer Providence, launched recently from the yard of the Fore River Ship & Engine Co., Quincy, Mass., for the marine service of the New York, New Haven & Hartford railroad, is equipped with a vertical steam windlass and two steam gypseys made by the American Ship Windlass Co., Providence, R. I.

The new torpedo boat Blakely successfully passed one hour during its trip last week and she will be accepted by the United States government. She traveled 24½ nautical miles in an hour, breaking her required speed by ½ knot. During the standardizing test her speed averaged 25.7 knots. She was constructed by the Geo. Lawley & Sons Corporation, Boston, Mass.

In 1801 an old lady left to the British Life Boat Institution, which is supported by private subscription, the sum of $2,000 to be paid on the death of a favorite kitten which had survived her and which was to be provided for with interest. In 1902 the cat disappeared and the courts have now decided to assume its death and let the Institution have the money on giving bond to provide for the cat in case it should come back.

Col. Milton B. Adams of the United States engineer corps, now serving in New Orleans, will be transferred to Buffalo to succeed Gen. Theodore A. Bingham, retired. Col. Adams has an excellent reputation as an engineer. He was appointed at the military academy in 1862 and entered the army as engineer. He became a captain in 1870, a major in 1883 and lieutenant colonel in 1898. Gen. Bingham was forced to retire from injuries received in a course of duty.

The Comanche, a high-speed gasoline launch built for S. H. Vandergrift of Pittsburg, a member of the New York and the Larchmont yacht club, was launched at the works of the builders, the Gas Engine & Power Co. and Charles L. Seabury at Morris Heights last week. The launch is 70 ft. 6 in. over all, 65 ft. on the water line, 6 ft. beam, and of minimum draught. The model has long torpedo boat stern and sharp overhang, with very fine entrance lines for the forward body. The forward deck is curved at the sides, and what is commonly known as "turtle back." The gasoline engine has nine cylinders, each 10 by 8 in. The hull is divided into three compartments, the forward and aft cockpits for passengers, and the engine is placed amidships. The hull construction is made up of three thicknesses of planking with copper fastenings. The outside planking is of teak below the water line and of Spanish cedar above the water line. A mahogany coaming incloses the entire cockpit. The builders have guaranteed that the launch will make 30 miles an hour, and are confident she can be made to do better.

The naval board of construction is considering the design of the battleship New Hampshire and the armored cruisers North Carolina and Montana, authorized at the last session of congress. There will be no novelties in the plans of those ships. They will follow closely the design of the fastest vessels of their respective classes. The New Hampshire will closely resemble the Mississippi, and the cruisers will be reproductions of the Tennessee. Of course, there will be improvements in minor particulars, but there will be no departure from the general type. There is some talk of making changes in the batteries so as to increase the number of large caliber guns. If this is done, of course, there must be a sacrifice of weight in other directions, and any proposition of that kind always leads to much discussion among the board officials. There can be little change in the character and disposition of the armament, however, for the reason that any radical change in that particular would require much alteration in the internal construction of the ships, and there is no time to carry this out, as the navy department desires to award the contracts for the vessels as soon as possible.

The annual report of the Pacific Mail Steamship Co. for the fiscal year ended April 30 has been published in pamphlet form. President Harriman in his report gives the changes in the capital account for the year as follows: Cost of steamship Colon written off $377,545; cost of six small boats at Panama written off $1,035; making a total of $378,580; from this amount the following deductions were made: Cost of equipping the Siberia with electrical generating apparatus, $1,140; expended for account of tug Arabs, building at San Francisco, $25,000; cost of two coal launches built at Acapulco, $2,985; cost of additions to water boat at Yokohama, $240; riparian rights and construction of wharf at Hong Kong, $1,989, making a total expended for these purposes of $31,369, and leaving a balance to credit of capital account of $347,216. President Harriman states also that after charging the fund for depreciation and for general and extraordinary repairs of steamers and other floating equipment with $208,946 for repairs and renewals, chargeable to this account and with $113,548 for depreciations chargeable against the Colon beached at Acajutla and for other property condemned during the year, there remained to the credit of this fund at the close of the year the sum of $914,397.

## LAKE SHIP BUILDING.

A new steel freighter to carry grain and package freight between Fort William and Montreal was launched from the Bertram ship yards, Toronto, on July 23, the ceremony of christening being performed by Mrs. John Bertram. The Haddington is of full canal size, her dimensions being: length 254 ft., beam 42 ft., depth 18 ft. Her engines will be of the triple expansion type, having cylinders of 15, 25 and 42 in. diameter and a stroke of 30 ft. Steam is furnished by two Scotch return tubular boilers, 10 ft. in diameter and 11 ft. long. On deck there will be six 3-ton cranes for handling cargo. Her capacity is 75,000 bu. of wheat, and her cost complete will be about $130,000. She is of handsome model and looks well in the water.

It is announced that the new steamer City of Benton Harbor will be taken to the Craig ship yard at Toledo at the close of the present season to be lengthened about 50 ft. The steamer went into commission at the beginning of the present season, having just been completed at Craig's. The additions will make her the largest sidewheeler on Lake Michigan. It is expected that the added length besides greatly increasing the steamer's carrying capacity will also increase her speed. It is stated that the contract with the Craig Ship Building Co. calls for a guaranteed speed of 22 miles an hour. If this is so she will be the fastest side-wheeler on the lakes. During the famous City of Erie-Tashmoo race neither vessel quite reached the speed of 22 miles though both came very close to it. It is reported that the Eastern States and Western States have exceeded this speed, but actual figures are not obtainable.

The work of rebuilding and repairing the tugs B. B. Inman and Excelsior, of the Union Towing & Wrecking Co., which were badly burned in the warehouse fire at head of the lakes the week of July 16, has begun. The Excelsior, the worst damaged of the two, will be rebuilt by contract with the Duluth Dock & Dredge Co. while the work on the Inman is being done directly by the towing company. The Inman was the most valuable of the tugs. She was built in 1895 at Port Huron, Mich., and was of 89 gross tons burden. Her length measures 81 ft., beam 19 ft., and depth 11 ft. The Excelsior was built in 1892 at Buffalo, was of 73 gross tons burden and measured 72 ft. long, 19 ft. beam and 10 ft. deep.

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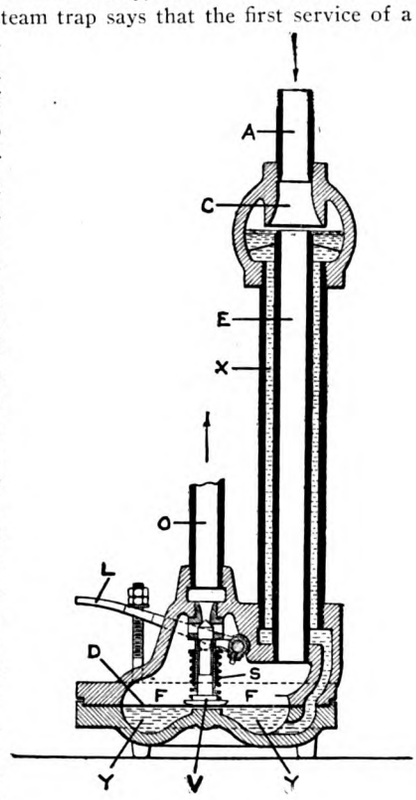
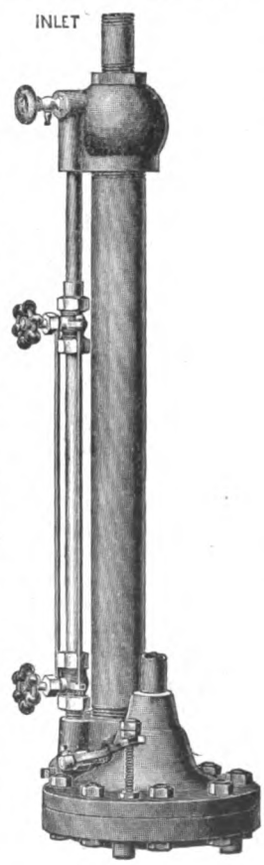
## FLINN STEAM TRAP.

Richard J. Flinn, West Roxbury, Mass., in a little folder describing the Flinn steam trap says that the first service of a steam trap is to remove condensation without waste of steam. The Flinn trap opens freely for water but closes tight when steam comes. He says also that the temperature of the water entering the trap should have nothing to do with its operation and adds that the Flinn trap handles water at any temperature. Without readjustment and while handling water at any temperature a trap should work equally well at every pressure from that of the atmosphere up to its maximum. The Flinn trap responds instantly under every condition. To prevent wire-drawing (which cuts valve seats) a valve should instantly move to its wide-open position, especially when handling small quantities of water. The valve of the Flinn trap is either wide open or tight shut.




In answer to the question as to what works the Flinn trap he replies that it is the weight of the water that enters the inlet pipe of the trap. The first water that comes to the Flinn trap water seals it. The very next ounce of water opens the valve. The valve stays wide open if the water keeps on coming. The valve closes instantly after discharging to its water seal level. The operation is just the same, as instantaneous and as reliable with pressures of 1 lb., 50 lb., 100 lb. or 150 lb. The temperature of the water may be 300 degrees—these traps handle it at any temperature, hot or cold, without letting even a thimbleful of steam escape. The operation of the trap may be described by reference to the accompanying diagram.

Briefly, the column of water X, acting on the diaphragm closes the valve. The water entering pipe E together with the action of the spring equalizes column X, and opens the valve. That's all there is to it. Describing the action in further detail—the water of condensation enters at A, fills lower chamber Y, pipe X and receiving chamber C up to the level of the top of pipe E. This column of water, acting on the under side of the diaphragm D forces the valve to its seat against the counter pressure of the spring S. Any additional water that enters the trap overflows through pipe E, filling chamber F and pipe E to a point about midway of its height, where the effect of the column of water in pipe X is balanced. The pressure on each side of the diaphragm is then equal—the shorter column in pipe E, aided by the spring, balancing the pressure of the longer column in pipe X. Any further increase in the height of the water in pipe E causes a depression of the valve V, which allows water to escape until the column has fallen to a level a little below the middle of pipe E when this valve closes again. This action is repeated at intervals according to the quantity of water entering the trap. So long as the water keeps coming in sufficiently large quantities the valve remains wide open.

## TONNAGE OF THE NATIONS.

Lloyd's Reporter of British and Foreign Shipping have just published their register books for 1904-5, which, it is needless to say, are indispensable in all shipping and insurance offices. The features of the volumes are well-known. Below are given the figures of the tonnage owned by the different nations, but it should be stated that in so far as American tonnage is concerned Lloyd's figures do not include the vessels of the great lakes which is full half the tonnage enrolled under the American flag. The total tonnage has increased during the year from 33,643,131 tons to 34,789,189 tons, and British tonnage from 16,006,374 tons to 16,580,845 tons:

| | 1903. | | 1904. | |
|---|---|---|---|---|
| | Steamers tons gross. | Sailing ships tons net. | Steamers tons gross. | Sailing ships tons net. |
| British | 14,193,582 | 1,812,792 | 14,866,527 | 1,714,318 |
| United States | 2,222,067 | 1,389,889 | 2,440,794 | 1,408,606 |
| Argentine | 70,862 | 24,918 | 64,325 | 24,474 |
| Austro-Hungarian | 557,745 | 20,952 | 569,990 | 15,166 |
| Belgian | 156,559 | 488 | 162,456 | 488 |
| Brazilian | 132,107 | 22,979 | 140,044 | 23,944 |
| Chilian | 67,186 | 36,572 | 69,681 | 39,204 |
| Chinese | 60,491 | ..... | 62,656 | ..... |
| Colombian | 877 | 934 | 2,445 | 934 |
| Cuban | 38,550 | 2,324 | 42,201 | 2,324 |
| Danish | 483,968 | 97,279 | 505,127 | 92,857 |
| Dutch | 613,219 | 45,626 | 643,529 | 44,000 |
| French | 1,153,761 | 468,255 | 1,252,457 | 440,909 |
| German | 2,794,311 | 488,936 | 2,891,869 | 477,938 |
| Greek | 325,895 | 52,304 | 350,497 | 50,721 |
| Haytian | 1,750 | ..... | 2,052 | ..... |
| Italian | 704,109 | 476,226 | 720,209 | 467,357 |
| Japanese | 585,542 | 141,276 | 668,360 | 3,057 |
| Mexican | 15,210 | 3,678 | 18,543 | 5,274 |
| Montenegrin | ..... | 5,449 | ..... | 5,319 |
| Norwegian | 935,229 | 718,511 | 1,017,248 | 700,406 |
| Peruvian | 4,992 | 9,704 | 5,132 | 10,012 |
| Philippine Islands | 43,138 | 8,261 | 45,437 | 8,132 |
| Portuguese | 51,217 | 50,087 | 51,240 | 47,761 |
| Roumanian | 16,600 | 634 | 19,318 | 634 |
| Russian | 578,343 | 231,305 | 609,622 | 230,893 |
| Sarawak | 2,270 | 669 | 2,270 | 669 |
| Siamese | 1,829 | ..... | 2,405 | ..... |
| Spanish | 720,822 | 43,625 | 714,172 | 40,683 |
| Swedish | 502,581 | 218,535 | 539,481 | 212,052 |
| Turkish | 92,869 | 61,625 | 93,259 | 60,408 |
| Uruguayan | 26,488 | 19,540 | 29,941 | 20,710 |
| Venezuelan | 3,058 | 1,060 | 3,210 | 1,282 |
| Zanzibar | 2,808 | ..... | 2,808 | ..... |
| Other countries | 23,330 | 5,333 | 23,379 | 5,973 |
| | 27,183,365 | 6,459,766 | 28,632,684 | 6,156,505 |

The hull of the steamer Canada, which went to the bottom of the St. Lawrence several weeks ago will be raised and taken to Sorel to be rebuilt.

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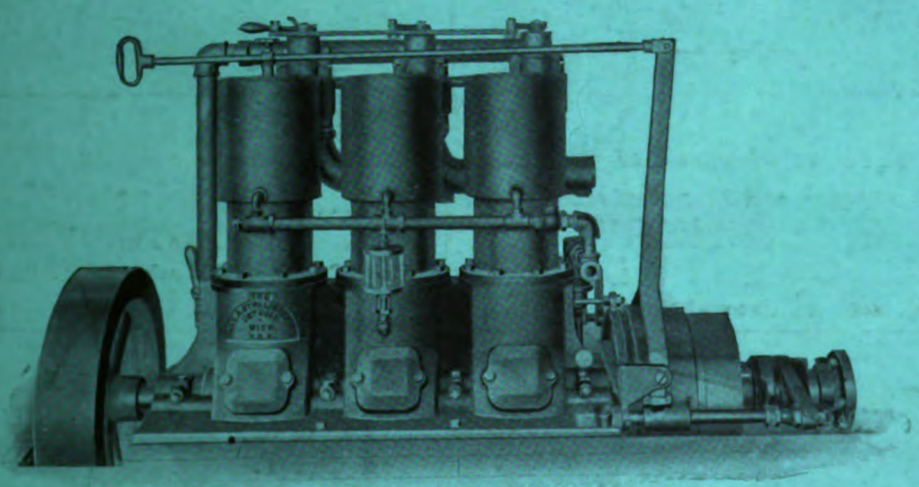
# MARINE REVIEW

VOL. XXX. CLEVELAND, O., JULY 28, 1904. No. 4



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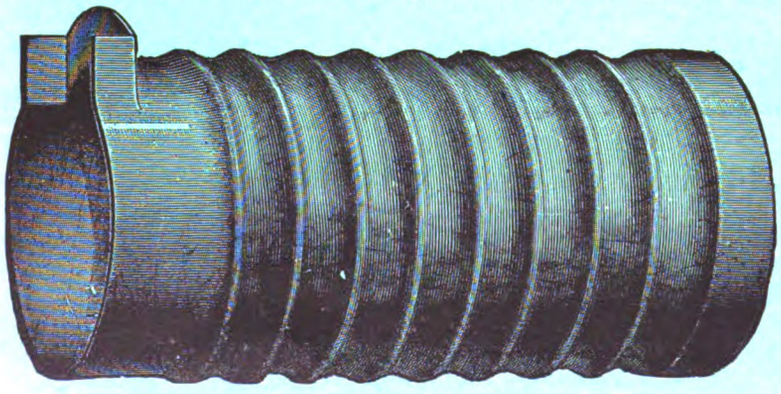

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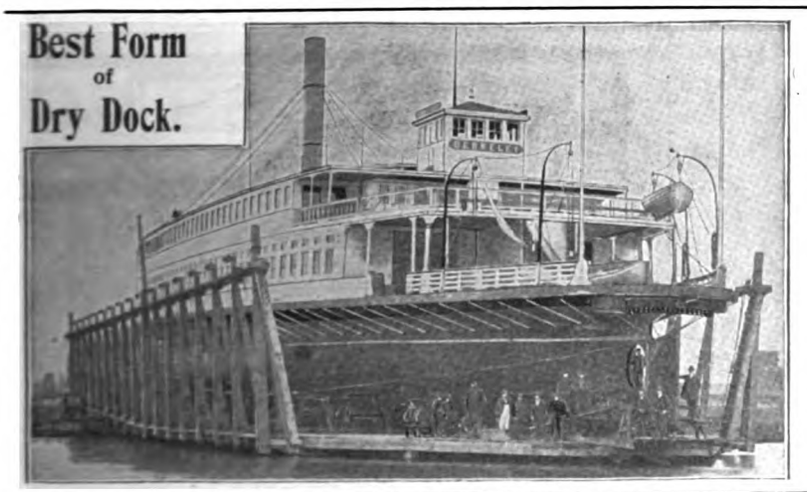


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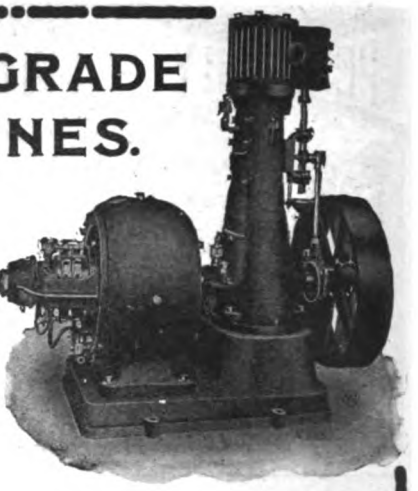

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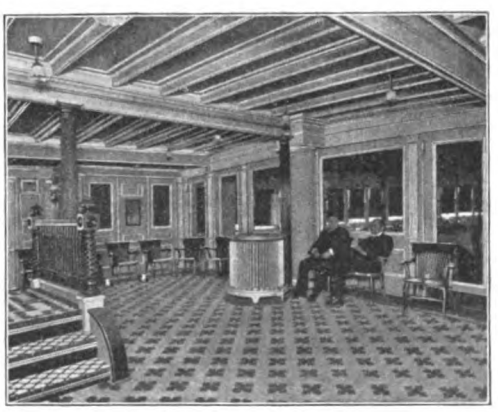

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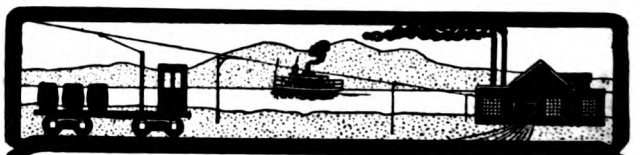

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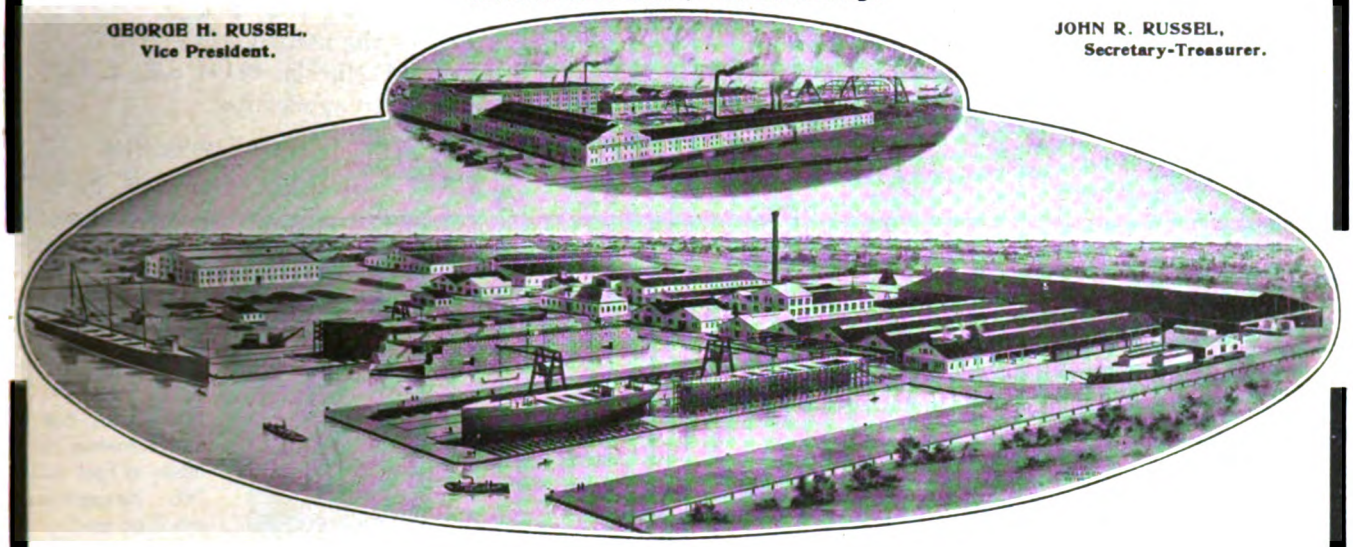

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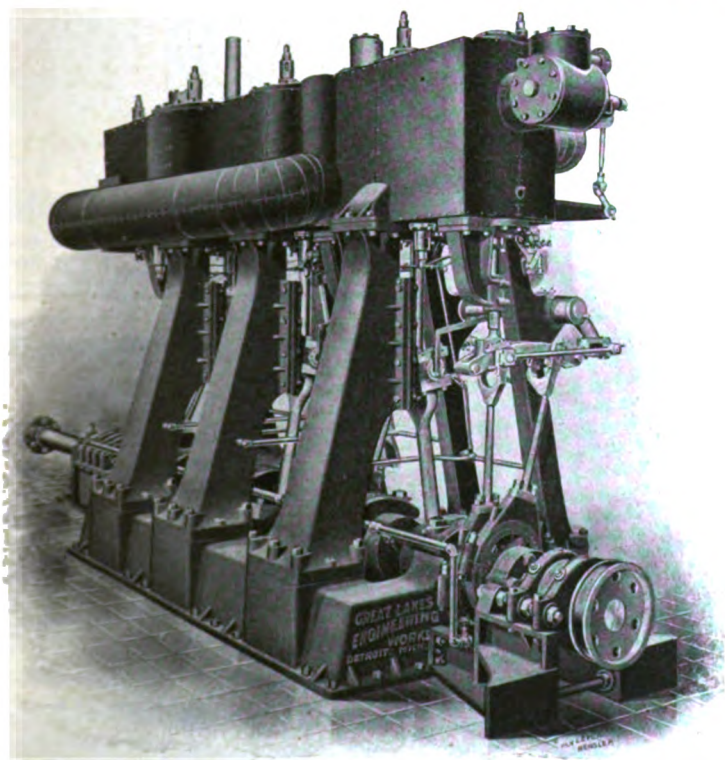


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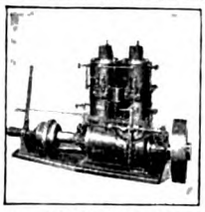

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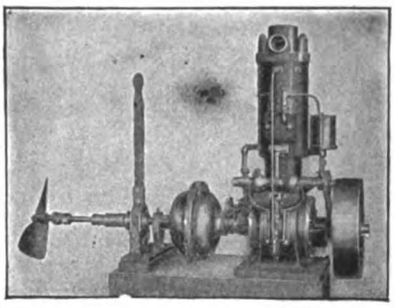

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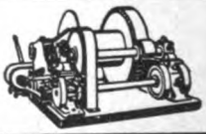

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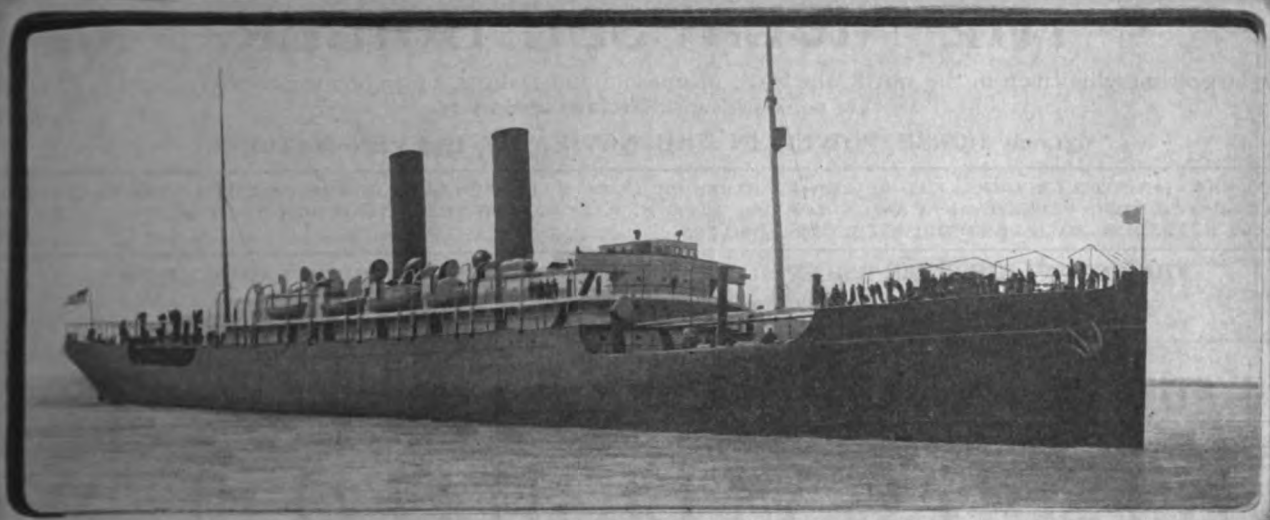

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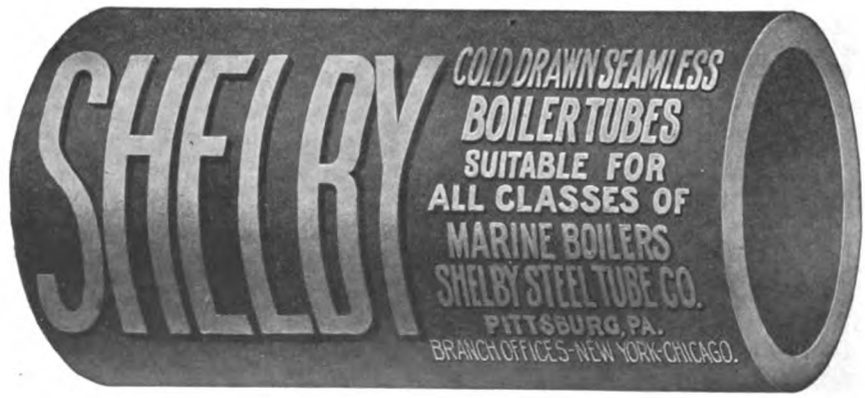



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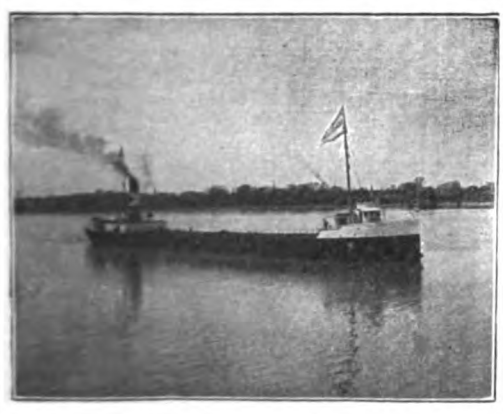

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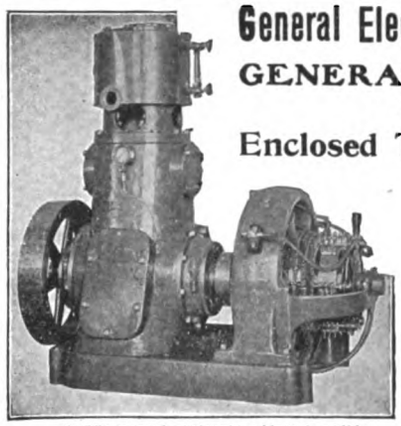

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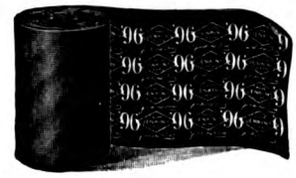


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U. S. Engineer Office, Duluth, Minn., July 8, 1904. Sealed proposals for building vessel yard and removing buildings at Duluth, Minn., will be received here until noon, Aug. 8, 1904, and then publicly opened. Information on application. CHAS. L. POTTER, Capt., Engineers. Aug. 4

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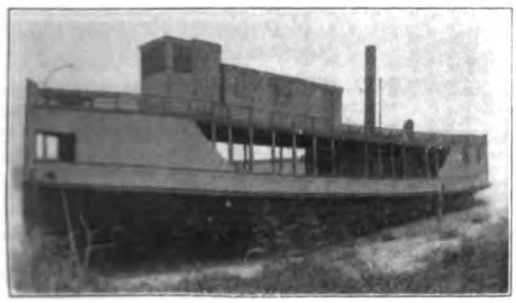

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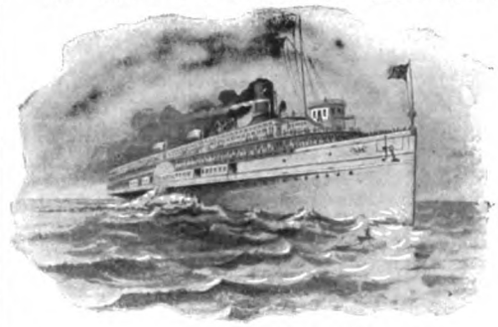

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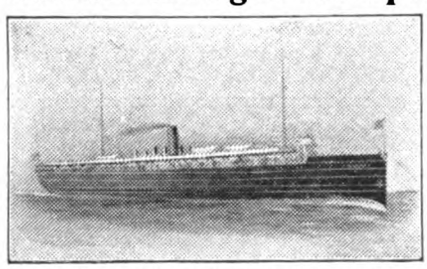

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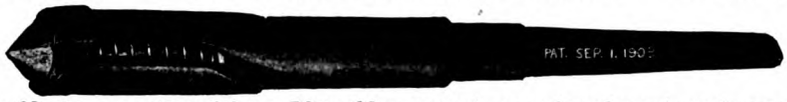


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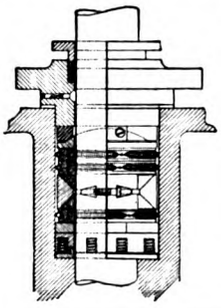

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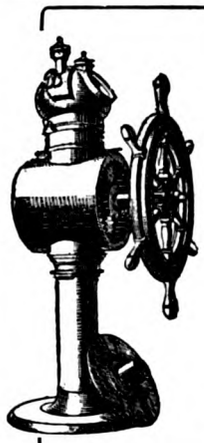

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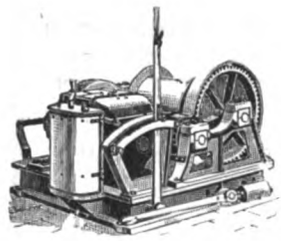

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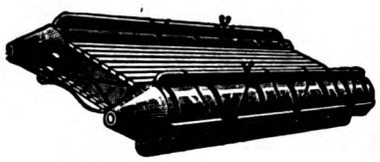

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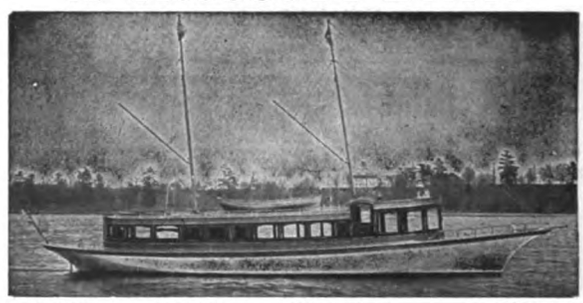

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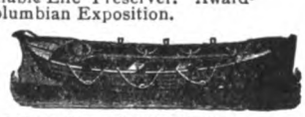

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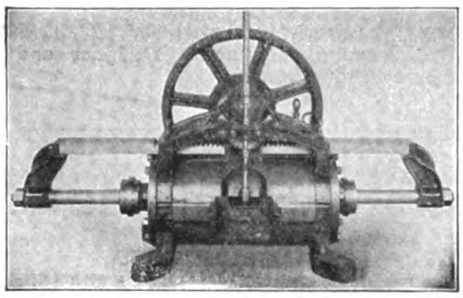

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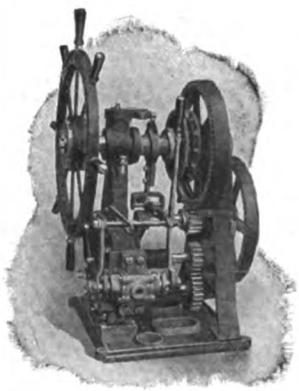

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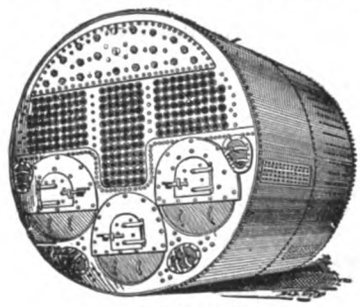

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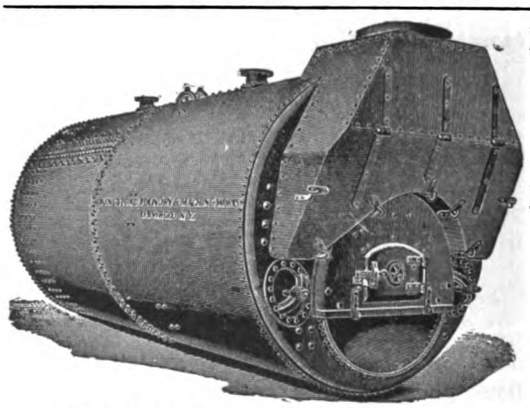

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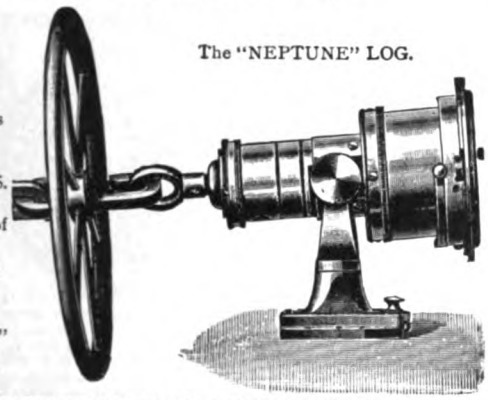

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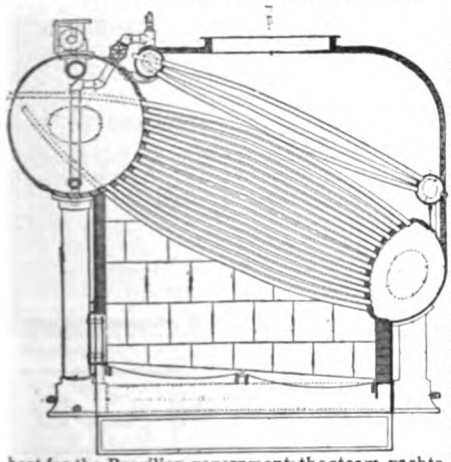

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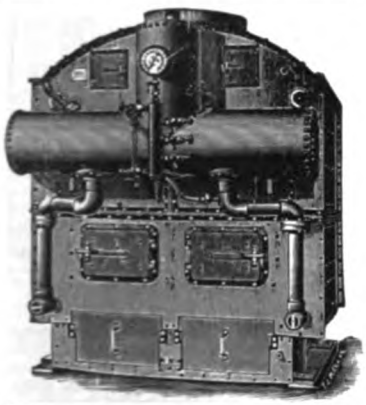

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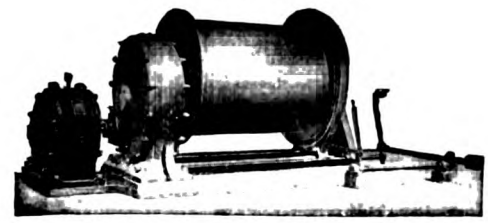

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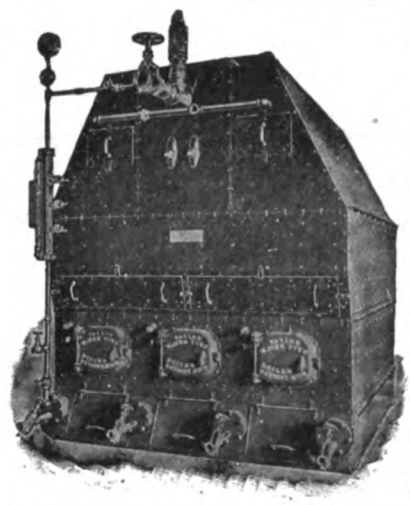

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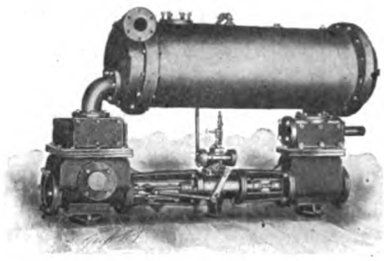

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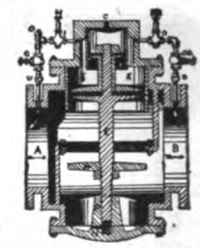

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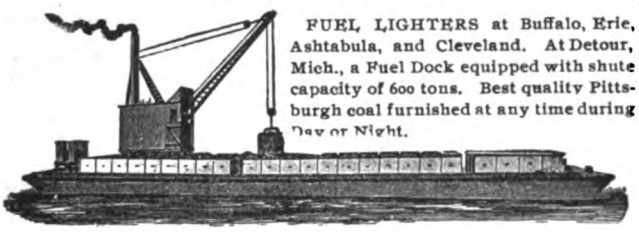

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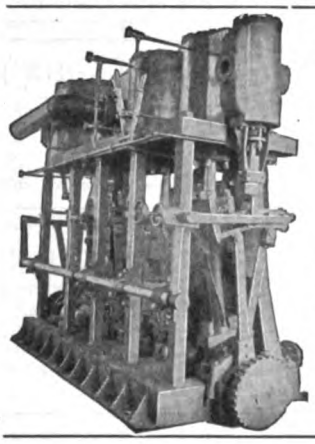

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Contractors Supply & Equipment Co..Chicago.

### CONDENSORS.

Great Lakes Engineering Works.. Detroit.
Thropp & Sons Co., John E....Trenton, N. J.

### CONTRACTORS SUPPLIES.

Contractors Supply & Equipment Co., Chicago.

### CONTRACTORS FOR PUBLIC WORKS.

Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co.
..... Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Hickler Bros. .....Sault Ste. Marie, Mich.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H..Milwaukee.
Sullivan, M. .....Detroit.

### CORDAGE.

Baker & Co., H. H.....Buffalo.
DeGrauw, Aymar & Co.....New York.
Upson-Walton Co.....Cleveland.

### CORK JACKETS AND RINGS.

Armstrong Cork Co.....Pittsburg, Pa.
Kahnweiler's Sons, D.....New York.

### COURSE FINDER.

Field's Patent Course Finder.....Cleveland.

### CHAIN CONVEYORS, HOISTS.

Brown Hoisting Machinery Co. (Inc.)....
..... Cleveland.
General Electric Co.....Schenectady, N. Y.
Lidgerwood Mfg. Co.....New York.
Westinghouse Electric & Mfg. Co.....
.....Pittsburg, Pa.

### CRANES, TRAVELING.

Brown Hoisting Machinery Co.....Cleveland.
Lidgerwood Mfg. Co.....New York.
Pawling & Harnischfeger.....Milwaukee.

### DIVING APPARATUS.

Morse, A. J. & Son.....Boston.
Schrader's Son, A.....New York.

### DREDGING CONTRACTORS.

Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co..
..... Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Hickler Bros. .....Sault Ste. Marie, Mich.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H..Milwaukee.
Sullivan, M. .....Detroit.

### DRYING APPARATUS.

Bayley & Sons Co., Wm....Milwaukee, Wis.
Sturtevant, B. F., Co.....Hyde Park, Mass.

### DRY DOCKS.

American Ship Building Co.....Cleveland.
Atlantic Works .....East Boston, Mass.
Buffalo Dry Dock Co.....Buffalo.
Chicago Ship Building Co.....Chicago.
Craig Ship Building Co.....Toledo, O.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works.....Detroit.
Lockwood Mfg. Co.....East Boston, Mass.
Manitowoc Dry Dock Co.....Manitowoc, Wis.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.....
.....Newport News, Va.
Shipowners Dry Dock Co.....Chicago.
Superior Ship Building Co....Superior, Wis.
United States Ship Building Co....New York.

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# Buyers' Directory of the Marine Trade.—*Continued.*

### ELECTRIC HOISTS AND CRANES.

General Electric Co.....Schenectady, N. Y.
Ridgerwood Mfg. Co.....New York.
Bayley & Harnischfeger.....Milwaukee.
Westinghouse Electric & Mfg. Co.....
..... Pittsburg, Pa.

### ELECTRIC LIGHT AND POWER PLANTS.

Bayley & Sons Co.....Milwaukee, Wis.
General Electric Co.....Schenectady, N. Y.
Mietz, Aug.....New York.
Sturtevant, B. F. Co.....Hyde Park, Mass.
Thropp & Sons, John E.....Trenton, N. J.
Westinghouse Electric & Mfg. Co.....
..... Pittsburg, Pa.

### ENGINE BUILDERS, MARINE.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Canadian Engine Works Co., Ltd.....
..... Toronto, Can.
Chicago Ship Building Co.....Chicago.
Chase Machine Co.....Cleveland.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Toledo, O.
Dunkley Engine Co.....Grand Haven, Mich.
Detroit Ship Building Co.....Detroit.
Dietzer, W. & A. Co.....Hoboken, N. J.
Dubuque River Ship & Engine Co..Quincy, Mass.
Great Lakes Engineering Works Detroit, Mich.
Harlan, Pusey.....Philadelphia.
Lake Ship Building Co.....Port Huron, Mich.
Lawley Mfg. Co.....East Boston, Mass.
Macbeth Iron Co.....Cleveland.
Mietz, Aug.....New York.
Milwaukee Dry Dock Co.....Milwaukee.
Morgan, Chas. D.....New York.
Morgan Steering Engine Co.....New York.
Newport News Ship Building Co.....
.....Newport News, Va.
Northwestern Steam Boiler & Mfg. Co.....
.....Duluth, Minn.
Pusey's Ship Yard .....Chester, Pa.
Simms Mfg. Co.....Milwaukee.
Superior Ship Building Co....Superior, Wis.
Thropp, J. E. & Sons Co.....Trenton, N. J.
Union H. G.....Buffalo.
United States Ship Building Co....New York.
Wood, Chas. P. & Co.....Chicago.

### ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.

Morgan, Chas. & Son.....New York.
Ritchie Mfg. Supply Co.....New York.

### ENGINEERING SPECIALTIES AND SUPPLIES.

Crane Co.....Chicago.
Jones & Mueller .....New York.
Lunkenheimer Co.....Cincinnati.
Mueller & Co. H.....Milwaukee.
New York Belting & Packing Co..New York.
Northwestern Steam Boiler & Mfg. Co.....
.....Duluth, Minn.

### ENGINEERS, MARINE, MECHANICAL, CONSULTING.

Boyd, Alexander .....Cleveland.
Cary, E. W. & Co.....Chicago.
Coffin, Leigh .....Duluth, Minn.
Corey, H. O.....Buffalo.
Emerson & Drake .....Philadelphia.
Morgan, Chas. D.....New York.
Nagle, James .....Cleveland.
Pittsburg Testing Laboratory, Ltd...Pittsburg.
Reed, Henry .....Buffalo.
Roelker, H. B.....New York.
Seaver, Perkins & Field.....New York.
Smith, Wm. .....Cleveland.
Todd, W. J.....Chicago.

### FANS FOR VENTILATION, EXHAUST, ETC.

Sturtevant, B. F. Co.....Hyde Park, Mass.

### FEED WATER PURIFIERS AND HEATERS.

Cochran Valve Co.....Troy, N. Y.

### FIXTURES FOR LAMPS, OIL OR ELECTRIC.

General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.....
.....Pittsburg, Pa.

### FORGES.

Sturtevant, B. F. Co.....Boston.

### FORGINGS FOR CRANK, PROPELLER OR THRUST SHAFTS, ETC.

Cleveland City Forge & Iron Co....Cleveland.
Dubuque River Ship & Engine Co..Quincy, Mass.
Macbeth Iron Co.....Cleveland.

### FLUE WELDING.

Fix's, S. Sons .....Cleveland.

### FUEL ECONOMIZERS.

Sturtevant Co., B. F.....Hyde Park, Mass.

### FUELING COMPANIES AND COAL DEALERS.

Hanna, M. A. & Co.....Cleveland.
Ironville, Dock & Coal Co.....Toledo, O.
Parker Bros. Co., Ltd.....Detroit.
Picklands, Mather & Co.....Cleveland.
Pittsburg Coal Co.....Cleveland.
Smith, Stanley B., & Co.....Detroit,
Smith Coal & Dock Co., Stanley B.Toledo, O.

### FURNACES FOR BOILERS.

Continental Iron Works.....New York.

### GASKETS, RUBBER.

New York Belting & Packing Co..New York.

### GAS BUOYS.

Safety Car Heating & Lighting Co..New York.

### GAS AND GASOLINE ENGINES.

Chase Machine Co.....Cleveland.
Georgian Bay Engineering Works.....
..... Midland, Ont.
Reliance Mfg. Co. .....City Island, New York.
Temple Pump Co.....Chicago.

### GAUGES, STEAM AND VACUUM.

American Steam Gauge & Valve Mfg. Co.
..... Boston.
Ashton Valve Co.....Boston.
Lunkenheimer Co. .....Cincinnati.
Standard Gauge Mfg. Co.....Syracuse, N. Y.

### GAUGES, WATER.

Bonner & Co., Wm. T.....Boston.
Lunkenheimer Co. .....Cincinnati, O.
Standard Gauge Mfg. Co.....Syracuse, N. Y.

### GRAPHITE.

Dixon Crucible Co., Joseph..Jersey City, N. J.

### HAMMERS, STEAM.

Chase Machine Co.....Cleveland.

### HEATING APPARATUS.

Bayley & Sons Co., Wm.....Milwaukee, Wis.
Sturtevant, B. F. Co.....Hyde Park, Mass.

### HOISTS FOR CARGO, ETC.

American Ship Building Co.....Cleveland.
Brown Hoisting Machinery Co. (Inc.).....
..... Cleveland.
Chase Machine Co.....Cleveland.
Elwell-Parker Electric Co.....Cleveland.
General Electric Co.....New York.
Georgian Bay Engineering Works.....
..... Midland, Ont.
Hyde Windlass Co.....Bath, Me.
Lidgerwood Mfg. Co.....New York.
Marine Iron Co.....Bay City.
Mietz, Aug. .....New York.
Pawling & Harnischfeger .....Milwaukee.
Westinghouse Electric & Mfg. Co.....
.....Pittsburg, Pa.

### HOLLOW STAYBOLT IRON.

Falls Hollow Staybolt Co...Cuyahoga Falls, O.

### HOSE, RUBBER.

New York Belting & Packing Co..New York.

### HYDRAULIC DREDGES.

Great Lakes Engineering Works.....Detroit.

### HYDRAULIC TOOLS.

Watson-Stillman Co., The.....New York.

### ICE MACHINERY.

Great Lakes Engineering Works.....Detroit.
Roelker, H. B.....New York.

### INDICATORS FOR STEAM ENGINES.

American Steam Gauge Co.....Boston.
Ashton Valve Co.....Boston.

### INJECTORS.

American Injector Co.....Detroit.
Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Lunkenheimer Co. .....Cincinnati.
Penberthy Injector Co.....Detroit, Mich.

### INSURANCE, MARINE.

Elphicke, C. W. & Co.....Chicago.
Fleming & Co., P. H.....Chicago.
Frankfort Marine, A. & P. G. Ins. Co.....
..... New York.

INSURANCE, MARINE—Continued.

Gilchrist & Co., C. P.....Cleveland.
Hawgood & Co., W. A.....Cleveland.
Helm & Co., D. T.....Duluth.
Hutchinson & Co.....Cleveland.
McCarthy, T. R.....Montreal.
McCurdy, Geo. L.....Chicago.
Mitchell & Co.....Cleveland.
Parker Bros. Co., Ltd.....Detroit.
Peck, Chas. E. & W. F..New York & Chicago.
Prindiville & Co.....Chicago.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago
Voss, F. D.....New York.
Weeks, F. H.....New York.

### IRON ORE AND PIG IRON.

Bourne-Fuller Co.....Cleveland.
Hanna, M. A. & Co.....Cleveland.
Pickands, Mather & Co.....Cleveland.

### LAUNCHES—STEAM, NAPHTHA, ELECTRIC.

Georgian Bay Engineering Works.....
..... Midland, Ont.
Marine Construction & D. D. Co.....
.....Mariner's Harbor, S. I., N. Y.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P.....Chicago.

### LIFE PRESERVERS, LIFE BOATS, BUOYS.

Armstrong, Cork Co.....Pittsburg.
Dreim, Thos. & Son.....Wilmington, Del.
Kahnweiler's Sons, D. .....New York

### LIGHTS, SIDE AND SIGNAL.

Russell & Watson .....Buffalo.

### LOGS.

Walker & Sons, Thomas ....Birmingham, Eng.
Also Ship Chandlers.

### LUBRICATING GRAPHITE.

Dixon Crucible Co., Joseph..Jersey City, N. J.

### LUBRICATORS.

Crane Co. .....Chicago.
Lunkenheimer Co. .....Cincinnati.

### LUMBER.

Martin-Barriss Co.....Cleveland.

### MACHINISTS.

Chase Machine Co.....Cleveland.
Gogebic Steam Boiler Works....Duluth, Minn.
Hickler Bros. .....Sault Ste. Marie, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Macbeth Iron Co.....Cleveland.
Union Machine & Boiler Co.....Cleveland.

### MACHINE TOOLS (WOOD WORKING).

Atlantic Works, Inc.....Philadelphia.

### MARINE RAILWAYS.

Hickler Bros. .....Sault Ste. Marie, Mich.

### MARINE GLUE.

Ferdinand & Co., L. W.....Boston, Mass.

### MARINE RAILWAYS, BUILDERS OF.

Crandall & Son, H. I....East Boston, Mass.

### MATTRESSES, CUSHIONS, BEDDING.

Fogg, M. W.....New York.

### MECHANICAL DRAFT FOR BOILERS.

American Ship Building Co.....Cleveland.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works ..Detroit.
Sturtevant, B. F. Co.....Hyde Park, Mass.

### MELTING POT AND PAYING LADLE.

(For Paying Seams of Decks with Marine Glue.)

Ferdinand & Co., L. W.....Boston.

### METALLIC PACKING.

Katzenstein, L. & Co.....New York.

### METAL POLISH.

Bertram's Oil Polish Co.....Boston

### MOTORS, GENERATORS—ELECTRIC.

General Electric Co.....Schenectady, N. Y.
Bayley & Sons Co., Wm.....Milwaukee, Wis.
Sturtevant, B. F. Co.....Hyde Park, Mass.
Westinghouse Electric & Mfg. Co.....
..... Pittsburg, Pa.

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# Buyers' Directory of the Marine Trade.—*Continued.*

### NAUTICAL INSTRUMENTS.
Ritchie, E. S., & Sons.....Brookline, Mass.

### NAVAL ARCHITECTS.
Hynd, Alexander .....Cleveland.
Kidd, Joseph.....Duluth, Minn.
Lovejoy, H. O.....Buffalo.
Matteson & Drake.....Philadelphia.
Mosher, Chas. D.....New York.
Nacey, James .....Cleveland.
Rice, Henry .....Buffalo.
Sadler, Perkins & Field.....New York.
Steel, Adam .....Cleveland.
Wood, W. J.....Chicago.

### OAKUM.
DeGrauw, Aymar & Co.....New York.
Stratford, Oakum Co.....Jersey City, N. J.

### OIL FOR PAINTING.
Sipe & Co., James B.....Allegheny, Pa.

### OIL ENGINES.
Mietz, Aug. .....New York.

### OILS AND LUBRICANTS.
Dixon Crucible Co., Joseph..Jersey City, N. J.
Standard Oil Co.....Cleveland.

### PACKING.
Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Katzenstein, L. & Co.....New York.
New York Belting & Packing Co...New York.

### PACKING TOOL.
Matteson & Drake .....Philadelphia.

### PAINTS.
Baker, Howard H. & Co.....Buffalo.
Detroit Varnish Co.....Detroit.
Detroit White Lead Works.....Detroit.
Forest City Paint and Varnish Co..Cleveland.
New Jersey Zinc Co.....New York.
Sipe & Co., James B.....Allegheny, Pa.
Upson-Walton Co. .....Cleveland.

### PATTERN SHOP MACHINERY.
Atlantic Works, Inc.....Philadelphia.

### PILE DRIVING AND SUBMARINE WORK.
Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co..
..... Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Hickler Bros. .....Sault Ste. Marie, Mich.
Parker Bros. Co., Ltd.....Detroit.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H...Milwaukee.
Sullivan, M. .....Detroit.

### PIPE, WROUGHT IRON.
Bourne-Fuller Co.....Cleveland.
Crane Co. .....Chicago.
Macbeth Iron Co.....Cleveland.

### PLANING MILL MACHINERY.
Atlantic Works, Inc.....Philadelphia.

### PLATES—SHIP, STRUCTURAL, ETC.
Bourne-Fuller Co. .....Cleveland.
Otis Steel Co.....Cleveland.

### PNEUMATIC TOOLS.
Allen, John F.....New York.

### POLISH FOR METALS.
Bertram's Oil Polish Co.....Boston.

### PRESSURE REGULATORS.
Kieley & Mueller .....New York.
Ross Valve Co.....Troy, N. Y.

### PROPELLER WHEELS.
American Ship Building Co.....Cleveland.
Atlantic Works .... East Boston, Mass.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Fore River Ship & Engine Co..Quincy, Mass.
Great Lakes Engineering Works.. Detroit.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co....Port Huron, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Macbeth Iron Co.....Cleveland.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.....
.....Newport News, Va.
Phosphor Bronze Smelting Co., Ltd.....
..... Philadelphia.
Roelker, H. B.....New York.
Sheriffs Mfg. Co.....Milwaukee.
Superior Ship Building Co....Superior, Wis.
Thropp & Sons Co., J. E.....Trenton, N. J.
Trout, H. G.....Buffalo.
United States Ship Building Co....New York.

### PROJECTORS, ELECTRIC.
General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.....
..... Pittsburg, Pa.

### PUMPS FOR VARIOUS PURPOSES.
Blake, Geo. F., Mfg. Co.....New York.
Great Lakes Engineering Works Detroit.
Kingsford Foundry & Machine Works....
..... Oswego, N. Y.

### PUNCHES, RIVETERS, SHEARS.
Allen, John F. .....New York.

### RANGES.
Russell & Watson .....Buffalo

### REFRIGERATING APPARATUS.
Great Lakes Engineering Works.....Detroit.
Roelker, H. B. .....New York.

### REGISTER FOR CLASSIFICATION OF VESSELS.
Great Lakes Register .....Cleveland.
Record of American & Foreign Shipping..
.....New York.

### REPAIRS—ENGINE AND BOILER.
(See also Boiler Manufacturers and Engine Builders.)
Georgian Bay Engineering Works.....
.....Midland, Ont.
Gogebic Steam Boiler Works....Duluth, Minn.
Forest City Boiler Co.....Cleveland.
Marine Iron Co.....Duluth, Minn.

### RIVETING MACHINES.
Allen, John F.....New York.

### RIVETS, STEEL, FOR SHIPS AND BOILERS.
Bourne-Fuller Co.....Cleveland.

### SAFETY VALVES.
American Steam Gauge & Valve Mfg. Co.
..... Boston.
Ashton Valve Co.....Boston.
Crane Co. .....Chicago.
Lunkenheimer Co. .....Cincinnati.

### SAIL MAKERS.
Baker, Howard H. & Co.....Buffalo.
Upson-Walton Co.....Cleveland.
Wilson & Silsby .....Boston.

### SALVAGE COMPANIES.
See Wrecking Companies.

### SEARCH LIGHTS.
General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.....
.....Pittsburg, Pa.

### SHEARS.
See Punches, Rivets, and Shears.

### SHIP AND BOILER PLATES AND SHAPES.
Bourne-Fuller Co.....Cleveland.
Otis Steel Co.....Cleveland.

### SHIP BUILDERS.
American Ship Building Co.....Cleveland.
Atlantic Works .....East Boston, Mass.
Bertram Engine Works Co., Ltd.Toronto, Can.
Buffalo Dry Dock Co.....Buffalo.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co.....Toledo, O.
Chicago Ship Building Co.....Chicago.
Detroit Ship Building Co.....Detroit.
Fore River Ship & Engine Co..Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Jenks Ship Building Co....Port Huron, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Manitowoc Dry Dock Co.....Manitowoc, Wis.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.....
.....Newport News, Va.
Roach's Ship Yard .....Chester, Pa.
Shipowner's Dry Dock Co.....Chicago.
Smith & Son, Abram.....Algonac, Mich.
United States Ship Building Co..New York.
Willard, Chas. P. & Co.....Chicago.

### SHIP CHANDLERS.
Baker, Howard H. & Co.....Buffalo.
Marine Mfg. & Supply Co .....New York.
Upson-Walton Co.....Cleveland.

### SHIP LANTERNS AND LAMPS.
Russell & Watson .....Buffalo.

### SHIP TIMBER.
Martin-Barriss Co.....Cleveland.

### SMOOTH-ON COMPOUND, FOR REPAIRS.
Smooth-On Mfg. Co.....Jersey City, N. J.

### STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.
Falls Hollow Staybolt Co..Cuyahoga Falls, O.

### STEAM VESSELS FOR SALE.
Elwell, Jas. W. & Co.....New York.
Gilchrist & Co., C. P. .....Cleveland.
Holmes, Samuel .....New York.
Lester, S. S.....Quebec, Can
McCarthy, T. R.....Montreal, Can.
Weeks, F. H.....New York.

### STEAMSHIP LINES, PASS. AND FREIGHT.
American Line .....New York.
Anchor Line .....Buffalo.
Boston Steamship Co.....Boston.
Cleveland & Buffalo Transit Co.....Cleveland
Detroit & Cleveland Line.....Cleveland.
Erie & Western Trans. Co.....Buffalo.
Goodrich Trans. Co.....Chicago.
International Mercantile Marine Co.....
..... Philadelphia.
Manitou Steamship Co.....Chicago.
Mexican-American S. S. Co..New Orleans, La.
New York & Cuba Mail S. S. Co ... New York.
Niagara, St. Catharines & Toronto Ry. &
Nav. Co. .....St. Catharines, Ont.
Northern Michigan Trans. Co.....Chicago.
Red Star Line .....New York.
Richelieu & Ontario Nav. Co. ...Montreal, Can.
United Fruit Co .....Boston.

### STEEL CASTINGS.
Macbeth Iron Co.....Cleveland.
Otis Steel Co.....Cleveland.

### STEERING APPARATUS.
American Ship Building Co.....Cleveland.
Chase Machine Co.....Cleveland.
Dake Engine Co.....Grand Haven, Mich.
Detroit Ship Building Co.....Detroit.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co....Port Huron, Mich.
Marine Mfg. & Supply Co.....Cleveland.
Moulton Steering Engine Co.....New York.
Pawling & Harnischfeger .....Milwaukee.
Sheriffs Mfg. Co.....Milwaukee.

### SUBMARINE DIVING APPARATUS.
Morse & Son, A. J.....Boston.
Schrader's Son, A.....New York.

### SURVEYORS, MARINE.
Gaskin, Edward .....Buffalo.
Hynd, Alexander .....Cleveland.
Lovejoy, H. O.....Buffalo.
Matteson & Drake .....Philadelphia.
Parker Bros. Co., Ltd.....Detroit.
Nacey, James .....Cleveland.
Rice, Henry .....Buffalo.
Steel, Adam .....Cleveland.
Wood, W. J.....Chicago.

### TESTS OF MATERIALS.
Hunt, Robert W. & Co.....Chicago.
Pittsburg Testing Laboratory, Ltd....Pittsburg.

### TILING, INTERLOCKING RUBBER.
New York Belting & Packing Co...New York.

### TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.
Allen, John F.....New York.
Watson-Stillman Co.....New York.

### TOOLS, WOOD WORKING.
Atlantic Works, Inc.....Philadelphia.

### TOWING MACHINES.
American Ship Windlass Co..Providence, R. I.
Chase Machine Co.....Cleveland.

### TOWING COMPANIES.
Donnelly Salvage & Wrecking Co.....
.....Kingston, Ont.
Great Lakes Towing Co.....Cleveland.
Midland Towing & Wrecking Co., Ltd....
.....Midland, Ont.

### TRAPS, STEAM.
Kieley & Mueller .....New York.
Lunkenheimer Co. .....Cincinnati.
Sturtevant Co., B. F., .....Hyde Park, Mass.

### TRUCKS.
Boston & Lockport Block Co.....Boston.

### TUBING, SEAMLESS.
Shelby Steel Tube Co.....Pittsburg, Pa.

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# Buyers' Directory of the Marine Trade.—*Continued.*

**VALVES, STEAM SPECIALTIES, ETC.**

American Steam Gauge & Valve Mfg. Co. ..... Boston.
Ashton Valve Co. ..... Boston.
Crane Co. ..... Chicago.
Jenkins Bros. ..... New York.
Kerby & Mueller ..... New York.
Lunkenheimer Co. ..... Cincinnati.
Ross Valve Co. ..... Troy, N. Y.

**VALVES FOR WATER AND GAS.**

Ross Valve Co. ..... Troy, N. Y.

**VARNISHES.**

Detroit Varnish Co. ..... Detroit.
Detroit White Lead Works ..... Detroit.
Forest City Paint & Varnish Co. ..... Cleveland.
New Jersey Zinc Co. ..... New York.
Also Ship Chandlers.

**VENTILATING APPARATUS FOR SHIPS.**

Pawley & Sons Co., Wm. ..... Milwaukee, Wis.
Sturtevant, B. F. Co. ..... Hyde Park, Mass.

**VESSEL AND FREIGHT AGENTS.**

Boland, John J. ..... Buffalo.
Brown & Co. ..... Buffalo.
Buell, Jas. W. & Co. ..... New York.
Fitzpatrick, C. W. & Co. ..... Chicago.
Fleming & Co., P. H. ..... Chicago.
Gilchrist & Co., C. P. ..... Cleveland.
Hall & Root ..... Buffalo.

VESSEL AND FREIGHT AGENTS—Con.

Helm & Co., D. T. ..... Duluth.
Hawgood & Co., W. A. ..... Cleveland.
Holmes, Samuel ..... New York.
Hutchinson & Co. ..... Cleveland.
Lester, S. S. ..... Quebec, Can.
McCarthy, T. R. ..... Montreal.
Mitcheli & Co. ..... Cleveland.
Parker Bros. Co., Ltd. ..... Detroit.
Prindiville & Co. ..... Chicago.
Richardson, W. C. ..... Cleveland.
Sullivan, D. & Co. ..... Chicago.
Weeks, F. H. ..... New York.

**WATER GAUGES.**

Bonner & Co., Wm. T. ..... Boston
Lunkenheimer Co. ..... Cincinnati, O.

**WIRE ROPE AND WIRE ROPE FITTINGS.**

Baker, H. H. & Co. ..... Buffalo.
DeGrauw, Aymar & Co. ..... New York.
Upson-Walton Co. ..... Cleveland.

**WHISTLES, STEAM.**

American Steam Gauge & Valve Mfg. Co. ..... Boston.
Ashton Valve Co. ..... Boston.
Lunkenheimer Co. ..... Cincinnati.

**WINDLASSES.**

American Ship Windlass Co. ..... Providence, R. I.
American Ship Building Co. ..... Cleveland.
Hyde Windlass Co. ..... Bath, Me.
Jenks Ship Building Co. ..... Port Huron, Mich.
Marine Mfg. & Supply Co. ..... New York.

**WINCHES.**

American Ship Windlass Co. ..... Providence, R. I.
Georgian Bay Engineering Works. ..... Midland, Ont.
Hyde Windlass Co. ..... Bath, Me.

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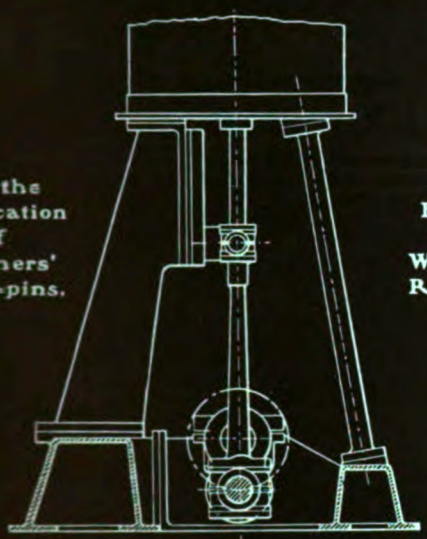

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| No. 22, Lake Shore Limited | *2:12 a.m. | *2:20 a.m. |
| No. 20, Chicago and Cleveland Exp. | *7:20 a.m. | ..... |
| No. 28, New York and Boston Exp. | *7:40 a.m. | *8:00 a.m. |
| No. 40, Toledo and Buffalo Accom | †10:00 a.m. | †10:30 a.m. |
| No. 32, Fast Mail | *11:25 a.m. | *11:30 a.m. |
| No. 48, Accommodation via Sandusky | †1:40 p.m. | ..... |
| No. 42, Boston–New York Express | ..... | *11:45 a.m. |
| No 44, Cleveland and New York Spl | ..... | *3:00 p.m. |
| No. 46 Southwestern Express | ..... | *3:10 p.m. |
| No. 116, Ashtabula Accommodation | ..... | †4:30 p.m. |
| No. 6, Limited Fast Mail | *5:40 p.m. | *5:45 p.m. |
| No 26, 20th Century Limited | *7:40 p.m. | *7:43 p.m. |
| No. 10, Chicago, N.Y. & Boston Spl. | *7:30 p.m. | *7:50 p.m. |
| No. 16, New England Express | *10:30 p.m. | *10:35 p.m. |
| No. 2, Day Express | †9:10 p.m. | †9:25 p.m. |
| No. 126, Norwalk Accommodat'on | †7:55 a.m. | ..... |

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|---|---|---|
| No. 7, Exposition Limited | *12:50 a.m. | ..... |
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| No 9, Day Express | ..... | †6:10 a m. |
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| No. 19, Lake Shore Limited | *7:15 a.m. | *7:25 a.m. |
| No. 23, Western Express | *10:30 a.m. | *10:35 a m. |
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| No 141, Sandusky Accommodation | ..... | †3:10 p m. |
| No. 43, Fast Mail | *4:35 p.m. | *4:40 p.m. |
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| No. 3, Fast Mail Limited | *10.50 p.m. | *10:55 p.m. |
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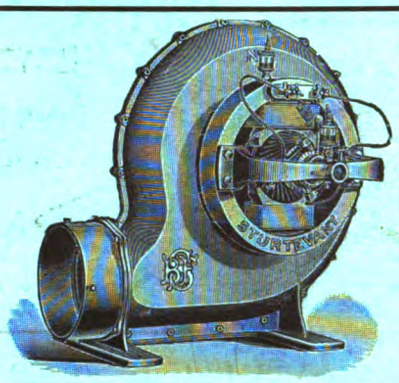

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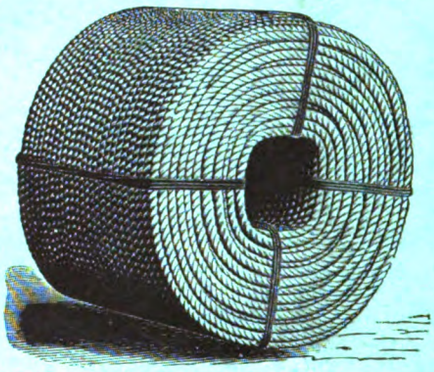

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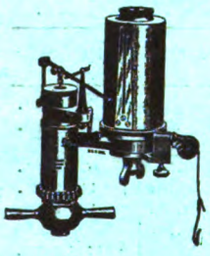

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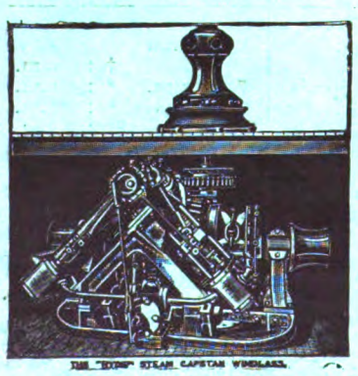

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